NAIC National Association of Insurance Commissioners & The Center for Insurance Policy and Research

CIPR White Paper

Financing Home Ownership:
Origins and Evolution of Mortgage Securitization
Public Policy, Financial Innovations and Crises

by

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CIPR White Paper WPS 2012-01 **Date: August 2012**

ABSTRACT

The primary purpose of this white paper is to provide an array of options for policymakers to consider in assuring insurance regulators have the best tools available to accurately value insurer residential real estate investments. The white paper details the impact of the housing and subprime market collapse on the insurance industry and presents views and opinions on the nature of the global financial crisis and the need for reform. The paper also traces the evolution of financing home ownership in the United States from the 1800s to the development of the GSEs and modern securitization to the private financial system and the subprime crisis. The paper analyzes the trends that have shaped the housing finance system with a focus on the dynamics of destabilization and the origins of crises.

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Acknowledgements:

The authors are grateful for the great help and contributions from NAIC CEO Terri Vaughan, Ed Toy and the Capital Market Bureau's members, Bob Carcano and Eric Kolchinsky from the Securities Valuation Office, Andrew Daleo from the Financial Regulatory Services Department and other staff of the NAIC, particularly Pamela Simpson of Regulatory Services for her editorial help. The authors also thank invited author Richard Field as well as all the NAIC members that reviewed the paper and helped improve it with their invaluable and insightful comments, especially Director Bruce Ramge (NE) and Kevin Fry (IL).

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Foreword

The primary purpose of this white paper is to provide an array of options for policymakers to consider in assuring insurance regulators have the best tools available to accurately value insurer residential real estate-related investments.

Private ownership of land was one of the fundamental beliefs leading to the formation of the United States of America. Our founding fathers believed widespread land ownership was crucial to promotion of economic growth and prosperity. However, land ownership is not static but changes over time. Early land ownership was largely for farming purposes. With the Industrial Revolution, interest in urban land ownership grew. Today, many family farms have been sold to corporate interests. This white paper traces the origins and evolution of the housing finance system and explores insurers' role in investing in private land ownership and to evaluate whether the current insurance regulatory framework provides adequate safeguards with regard to insurers' investments in residential mortgages and residential mortgage-backed securities (RMBS). The goal is to document historical events shaping the current environment and provide some insight for public policymakers to consider as they weigh various options available to them to make RMBS markets more efficient. As a practical matter, the authors have decided to concentrate on residential housing rather than including commercial real estate in the paper. Although the paper concentrates on RMBS, the authors believe many of the insights applicable to RMBS will also apply to other securitized assets.

It is important to note that the opinions expressed in the white paper are those of the authors and are not necessarily the opinions of the NAIC or any of its members. The paper is intended to inform the public policy debate with regard to next steps in making sure insurance regulators have the best available information to evaluate the assets held by insurers. The ability to accurately evaluate insurer assets is an important element of the insurance regulatory framework in the U.S.

The paper starts with providing a historical perspective on home ownership and how views of land ownership and control evolved during the history of the U.S. The paper also examines the development of the U.S. housing finance system. Several interesting and little known facts were uncovered during the research that should be of great interest to policymakers today. They are all covered in the sections found in the appendix.

First, securitization of mortgages is much older than most people think, surfacing in the 1870s with the farm mortgage debenture movement. These innovations were successful for a time;

however, the financial crisis of the 1890s led to many mortgage bank failures. Interestingly, loose underwriting standards that led to shoddy loans and the inevitable rise in defaults were blamed. This fact should sound familiar to those evaluating current events.

As one might expect, the booming economy of the 1920s led to speculation and easy access to credit. This led to unsustainable debt-to-equity ratios in 1929, resulting in a severe liquidity crisis, declining home values and defaults leading to foreclosures. By 1933 almost half of all mortgages were in default and home prices had dropped roughly 50 percent. The Federal Housing Administration was created in 1934 to guide federal policy on home ownership. The Federal National Mortgage Association (now known as "Fannie Mae") was created in 1938 to provide a secondary mortgage market supported by the federal government.

The decade of the 1960s brought with it rising inflation and high interest rates. Savings and loans associations were first allowed to offer adjustable interest rate mortgages in the 1960s. Fannie Mae was taken public in 1968 and allowed to buy conventional mortgages. The Government Home Loan Mortgage Corporation (now known as "Ginnie Mae") was created in 1968 to securitize FHA and VA loans. The Federal Home Loan Mortgage Corporation (now known as "Freddie Mac") was created in 1970 to help savings and loans association by providing a secondary market for conventional mortgage loans.

Throughout most of the 2000s, Fannie Mae and Freddie Mac contributed to the growth of both affordability loans and subprime mortgages. By 2008, these government sponsored enterprises (GSEs) held about 44 percent of the nation's mortgages with combined obligations of more than $5 trillion. When the bubble burst, both GSEs suffered huge losses. In 2008, both Fannie Mae and Freddie Mac were placed into a conservatorship under the Federal Housing Finance Agency (FHFA).

The paper explores the modern age of securitization linking the housing markets with the capital markets so affordable housing would be readily available. Details on the structure of today's securities are described. While virtually any asset could be securitized, for simplicity, the authors focus on RMBS in this paper.

Prior to widely available securitization, mortgage originators generally held and serviced the mortgages they created. The RMBS markets date back to 1970 when Ginnie Mae (which had itself been created two years earlier) sold the first offering, a mortgage pass-through certificate. In response to investor demands, collateralized mortgage obligations (CMOs) were created in 1983 to allow customization to match maturities and to address different levels of risk appetites from investors.

Facilitated by amendments to the 1933 Glass-Steagall Act by the Gramm-Leach-Bliley Act of 1999, the 2000s first saw a huge run-up in housing values followed by the inevitable market correction. However, investors and borrowers were convinced that housing values always went up and made deals accordingly. A typical loan at the time might be for an adjustable rate, interest-only or a low (i.e., generally 5 percent or less) or no down-payment based on the assumption housing values would go up over 20 percent within a three-year period at which time the borrower could refinance and receive a "conventional" loan (initially defined as one requiring at least 20 percent equity). When the rush to refinance subsided, the lenders sought other alternatives to keep the origination fees flowing. They found them in borrowers that would not otherwise qualify as creditworthy. Thus, mortgage lenders lowered their underwriting standards in search of origination fees. After all, they could simply collect the fee and off-load all or most of the risks to the secondary markets.

The paper explores the role of the financial guarantee insurers in the global financial crisis. Encouraged by the rating agencies to expand and diversify, financial guarantors decided that guaranteeing housing values might be just the ticket. They applied their successful business model for insuring against credit defaults by municipalities to the RMBS market with what at first seemed acceptable results, but later proved to be a mistake.

Insurers' exposure to RMBS is covered with a concentration on the period from 2008 to 2011. As expected, life insurers are heavier users of RMBS than their property and casualty counterparts. In particular, life insurers are interested in RMBS because of the possibility of providing a better asset-to-liability match from the longer duration of RMBS.

A section called *Regulatory Framework Changes in Response* documents recent changes insurance regulators have made to gain a greater understanding of the quality and value of insurer investments in RMBS. It describes the movement away from reliance on rating agency evaluations—the rating agencies thought all financial guarantors were AAA or AA and as a result thought the securitizations they guaranteed were AAA or AA quality too. The current procedure is to model each security and perform a quality assessment.

Following the historical and explanatory portion of the paper is the section *What Does the Future Hold?* This section has five subsections where invited authors contribute their views of how markets for RMBS can be restarted in ways that do not repeat the mistakes of the past. Each author offers his own perspective on what might work best as we go forward. While each suggested solution is unique, there are some common features to them. All the authors agree the RMBS markets are not currently operating at anything near peak efficiency. They generally

agree the buyers do not trust the sellers to be completely forthcoming with regard to asset quality and value. They generally agree that valuation transparency in the form of complete disclosure and greater market price availability would open up the markets and allow investors and regulators to have a greater level of confidence in the asset valuations.

A conclusion summarizes common suggestions and distinguishes differences of opinion. It is safe to say there are a number of possibilities for policy makers to consider.

Historical Perspective on Financing Home Ownership

To effectively understand insurers' involvement in residential real estate it was necessary to study how land use and private property rights have evolved over time. Private ownership of land has been an important cornerstone of American society. The American Revolution happened at least in part because people disagreed with the notion that all land belonged to the British Crown. The Founding Fathers believed private land ownership would promote economic growth and prosperity.

Throughout the history of the United States, homeownership has been synonymous with the "American Dream." However, in the early years, home ownership was generally associated with a family farm. It was not until the Industrial Revolution that home ownership for urban residents became more important. Homeownership was less than 50 percent until the 1950s when it showed a sharp increase to roughly 65 percent. From 1965 to 1995 the home ownership rate stayed remarkably stable in the 64-65 percent range. In 1995 the home ownership rate started to rise and it peaked in 2004 at 69.2 percent. It has since fallen back to 66 percent as of 2011. Further information on *Land Use and Private Property* and on the *Home Ownership thorough History* is contained in the Appendix.

Studying the evolution of housing finance it was surprisingly revealed that on several occasions circumstances have repeated themselves with regard to mortgage-backed securities in ways very similar to the 2007-2008 time period. In the 1870s, mortgage banks were formed to finance loans to people securing land in the Midwest and West. The mortgage banks raised funds by selling Mortgage Backed Bonds. These bonds were similar to today's securitized products, however there were differences. Investors assumed the credit risk of the mortgage bank and if the bank failed, then the investors, through a trustee, took possession of the specific pool of loans and the loans were liquidated. There was a financial crisis in the 1890s. The loose underwriting standards in place at the time resulted in shoddy loans and inevitable defaults much like recent times.

In the "Roaring Twenties," the booming economy led to over-valued real estate and a tripling of the total residential mortgage debt—much of it funded by the savings and loans associations. A form of securitization similar to today's residential mortgage-backed securities added fuel to the fire along with wide-spread over-appraising of properties and lax loan underwriting standards. By 1933 almost half of all mortgages had defaulted and home prices dropped roughly 50 percent.

In the mid-1960s, rising inflation and interest rates presented serious challenges to the housing finance system. The savings and loans associations relied on short-term deposits to fund long-term mortgage obligations. As the interest rates paid on short-term deposits rose, the interest rate revenue from long-term fixed rate mortgages did not, placing a serious squeeze on profit margins for the savings and loans associations. The high interest rates on new home loans weakened housing demand, further straining the savings and loans associations. This perfect storm led to the savings and loans crisis in the late 1980s.

The fourth major crisis is well known to all. Relaxed loan underwriting in the early 2000s led to unrealistically high housing values followed by the inevitable correction. Borrowers were moved to refinance existing home loans and buy property beyond their means. People were convinced that housing values always went up and made deals accordingly. Further, non-agency residential mortgage-backed securities were becoming more common as the GSE share of mortgage originations declined to 40 percent in 2006. When the rush to refinance subsided, lenders sought other alternatives to keep the origination fees flowing. They found them in borrowers that would not otherwise qualify as creditworthy. Thus, mortgage lenders lowered their underwriting standards in search of origination fees. After all, they could simply collect the fee and off-load all or most of the risks to the secondary markets. More detailed information on the *Evolution of Housing Finance* is contained in the Appendix.

The modern age of securitization began with the federal government's plan to create an efficient government-guaranteed secondary market instrument to expand affordable housing. This plan linked the housing market with the capital markets. The securitization technique involves the issuance of a debt instrument backed by underlying revenue-generating assets (e.g., mortgage loans) that are pooled together by the issuer for that purpose. Although the age of securitization was kick-started with residential mortgage-backed securities (RMBS), in theory, any asset that can produce a revenue stream can be transformed (i.e., securitized) into a tradable debt instrument and marketed to investors. Investors who would buy an RMBS would receive a share of the monthly payments made by the homeowners along with principal from the underlying loans.

The purpose of residential mortgage securitization is to facilitate the flow of capital from a wide investor base into the mortgage credit market, increasing the availability of credit to homebuyers while reducing the cost. Since its early days, securitization has provided the financing for the vast majority of mortgages in the country. Insurers are an important source of funds for the real estate markets.

Securitization in the form of residential mortgage-backed securities is an important tool for real estate markets and investors, including insurers. As insurers became more comfortable with the RMBS market, there was interest in investments providing a better match with long-term liabilities. The answer was found in the development of the collateralized mortgage obligation (CMO). CMOs helped investors better manage prepayment risk and interest rate risk inherent on the RMBS market.

Another development was the creation of the private-label or non-agency RMBS. This market grew rapidly during the housing boom peaking in 2006. By 2008, the market share of the private-label or non-agency RMBS was only a small fraction of its 2006 peak. Today the private-label RMBS is very small with almost all RMBS being backed by the GSEs. For further information on the RMBS and CMO markets, refer to the Appendix in the section called *The Modern Age of Securitization*.

Securitization and the Subprime Crisis

The leverage in the mortgage market, which was growing since the 1980s, surged during the boom years, 2001–2007. The mortgage debt outstanding (MDO) surpassed any other lending sector, both in terms of the rate of growth and the amount of outstanding loans. The residential MDO grew at around 12 percent per year from 2000 to 2007, when it peaked at $11.2 trillion, an amount greater than the total outstanding of the Treasury, non-financial corporate and credit card debt combined.

Before the emergence and proliferation of subprime mortgages, the housing finance system was tightly organized around the GSEs, a few mortgage insurers and large lending institutions. Through the close interaction of these parties, this system had developed accepted underwriting standards that could effectively weed out most unqualified borrowers, and a working model for setting risk premiums for guaranteeing mortgage credit losses.

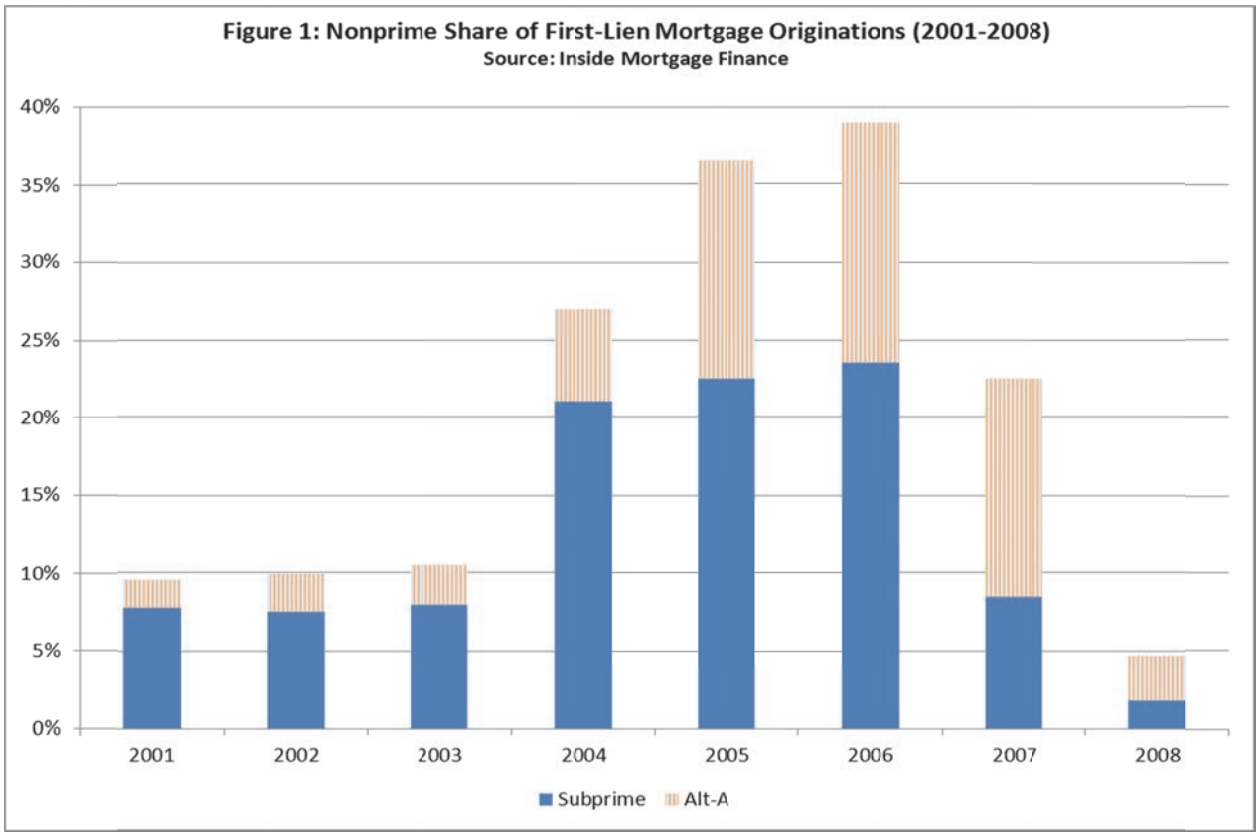
In that GSE-dominated, pre-subprime environment, securitization involved primarily deals backed by conforming prime loans. The quality of government agency RMBS collateral pools allowed a good deal of certainty in projecting future cash-flows, while credit enhancement removed borrower default risk as a concern. The main risk factors left that needed to be assessed and controlled were prepayment and reinvestment risk. This housing finance system, with the GSEs at its core, helped provide the liquidity the primary market needed and, in turn, fueled the housing market, boosting home ownership rates while creating a large and liquid RMBS market internationally.[1]

Financial deregulation—with the passage of the Gramm-Leach-Bliley Financial Services Modernization Act[2] in 1999, the advent of the "originate and distribute" banking business model, and the very accommodative monetary policy, in an environment of rising home prices and increasing leverage in the household sector—created a very favorable setting for the growth of high-risk financial instruments like subprime residential MBS.

[1] Cho, M. 2009. "Managing Mortgage Credit Risk: What Went Wrong With the Subprime and Alt-A Markets?" *International Real Estate Review,* Vol. 12 No. 3.

[2] The Gramm-Leach-Bliley Act allowed the merging of commercial and investment banking. It also permitted banks to own subsidiaries active in markets that used to be off-limits to them.

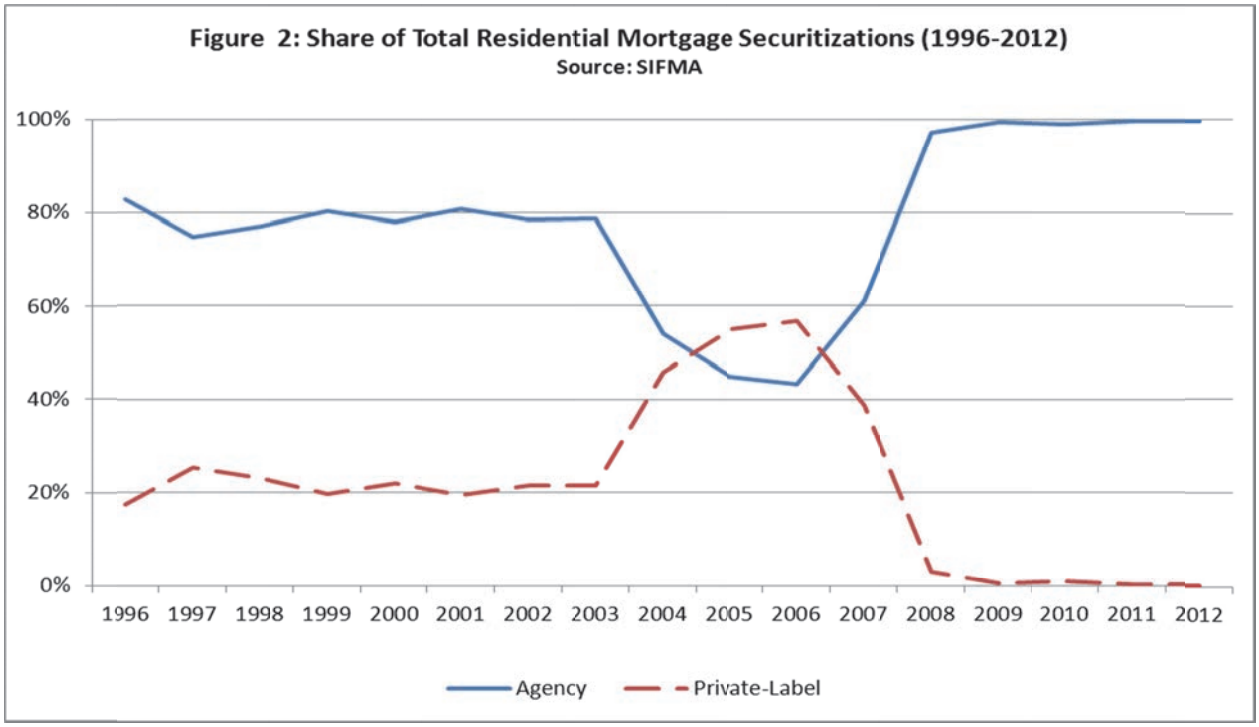
Subprime loan originations surged as borrowers[3] were taking advantage of historically low interest rates to purchase new homes or refinance existing loans. In fact, the nonprime (both subprime[4] and Alt-A[5] loans) share of all first-lien mortgage originations jumped from nearly 10 percent in 2001 to approximately 39 percent in the peak of the housing and credit boom in 2006 (Figure 1).



Well over half of all subprime loans originated during that period were for cash-out refinancing as homeowners extracted equity from their appreciating homes. Equity extraction worked well, for both borrowers and lenders (protecting them from losses), as long as home prices kept rising. The booming housing market gave mortgage lenders confidence that homes' inflating values were sufficient support for a business model built on lax underwriting, over-leverage, and opaque risk-management processes.

[3] These borrowers had a credit score below the agency cut-off and could not qualify for a prime mortgage conforming to GSE requirements.
[4] Mortgage normally made out to borrowers with lower credit ratings, usually below 600.
[5] Mortgages lacking full documentation and/or high loan-to-value ratios. In terms of credit quality, Alt-A loans fall between prime and subprime.

Nearly all the subprime RMBS, and most nonprime RMBS, were issued by private conduits, which were controlled mostly by investment banks and large commercial banks. The accounting scandals that shook both Freddie Mac (in 2003) and Fannie Mae (in 2004) helped shift the balance of power in mortgage funding towards private-label issuers,[6] strengthening their relative position and encouraging more risk-taking. During the peak years of the market, private-label securitization was the driving force of the expansion in housing and the credit markets (Figure 2). The GSEs' self-identified share of subprime RMBS was zero, while they accounted for only 11 percent of Alt-A securitizations in 2005 and around 12 percent the year after.[7]



Most subprime mortgages were adjustable-rate mortgages (ARMs), with an initial low (teaser) interest rate scheduled to reset in a pre-specified date, typically to a higher rate. Essentially, subprime ARMs were short-term loans, designed to be refinanced in a few years, thus highly profitable for lenders that had also incorporated high prepayment fees to discourage undesirable early refinancing. Interest-only[8] and payment-option[9] ARMs, which did not appear

[6] Cho, M. 2009. "Managing Mortgage Credit Risk: What Went Wrong With the Subprime and Alt-A Markets?" International Real Estate Review, Vol. 12 No. 3.

[7] Belsky, E.S. and Richardson N. 2010. "Understanding the Boom and Bust in Nonprime Mortgage Lending." Joint Center for Housing Studies, Harvard University.

[8] An interest-only ARM allows for payment for interest only for a specified number of years. After that, both principal and interest must be repaid leading to much higher payments for the remainder of the term.

until the 2000s, experienced a dramatic increase in their shares in total subprime origination in the five years between 2002 and 2006. Also, the share of low- and no-documentation mortgages jumped from 28 percent in 2001 to over 50 percent in 2006. [10]

The shift from GSE to private-label securitization, marking the transition from the transparent credit-based system of rationing through strict underwriting to risk-based pricing where there is little transparency, had profound consequences for lenders, borrowers and investors.[11]

Subprime ARMs were not effectively vetted under any real stress economic conditions and their risks were not adequately modeled. The resulting unreliable performance data and the high degree of cash flow uncertainty meant that proper risk management was highly challenging from the outset, laying the path to the problems that were soon to follow.

The excess liquidity[12] created by the easy monetary policy in the 2000s encouraged lending institutions to expand the available borrower pool by relaxing underwriting standards for non-traditional, structurally riskier, non-amortizing mortgages in order to boost profitability and competitiveness. Banks would earn fee income for loan origination, and at the same time transfer mortgage loans off their books to escape reserve and capital requirements.[13]

Even after long-term interest rates started to inch up in 2003, with the prime borrowing pool mostly exhausted, banks tried to maintain origination volumes and hence earnings, primarily by lowering underwriting standards to bring in more marginal borrowers.

The deepening of the fee-based originate-to-distribute business model—even though it enabled, at least in theory, effective capital replenishment, efficient transfer of risks, increased access to liquid markets, and economies of scale—also depended on different parties whose interests were misaligned, to underwrite, originate and service the loans.

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[9] A payment-option ARM is an adjustable-rate mortgage that allows you to choose among several payment options each month, including traditional payment, interest-only and minimum payment (the amount of any interest not paid is added to the principal of the loan, increasing the amount owed as well as increasing the interest).

[10] Cho, M. 2009. "Managing Mortgage Credit Risk: What Went Wrong With the Subprime and Alt-A Markets?" International Real Estate Review, Vol. 12 No. 3.

[11] Belsky, E.S. and Richardson N. 2010. "Understanding the Boom and Bust in Nonprime Mortgage Lending." Joint Center for Housing Studies, Harvard University.

[12] Belsky, E.S. and Richardson N. 2010. "Understanding the Boom and Bust in Nonprime Mortgage Lending." Joint Center for Housing Studies, Harvard University.

[13] Wray, L.R. 2008. "Financial Markets Meltdown: What Can We Learn from Minsky?" The Levy Economics Institute.

Brokers' incentives were all concentrated on the front end, and were completely insulated from any risk or payout based on long-term loan performance.[14] A principal-agent problem[15] emerged between brokers and investors, with the first only interested in loan volume and the latter interested in credit quality and asset performance. With banks no longer required to hold mortgages they originated in their own loan portfolios, the ability to readily dispose of that risk was essential to the growth of risky nonprime mortgages.

The capital markets were ready to absorb the risk and provide the needed funding for subprime mortgages. A rising percentage of subprime mortgage originations were securitized in the few years leading to the crisis from about 50 percent of the total volume of the total dollar value of subprime mortgages that was securitized in 2001, to more than 80 percent in 2006. In 2005 and 2006, more than $1.2 trillion in subprime mortgages was originated, of which close to $1 trillion was absorbed by the capital markets in the form of securitized securities.[16]

To meet strong investor demand for mortgage securitizations, particularly for subprime-backed securities that offered higher yields than prime RMBS and most corporate bonds, investment banks were willing to source shoddily underwritten mortgages with increasingly riskier features that resulted in lower monthly payments but much higher reset risk. The trifecta of low interest rates, opacity that prevented assessment of the decline in lending standards, and rising home prices kept the money flowing in the mortgage and securitization markets, fostering even higher leverage and greater risk-taking by both borrowers and investors.

Information asymmetries between financial intermediaries and investors were endemic in the largely unregulated, private-label securitization market. Lending institutions used these asymmetries to their advantage at the expense of investors who, partly due to incomplete information, underpriced risk and overvalued mortgage securities, thereby continuing to supply the market with relatively cheap credit. The increased reliance in private-label securitization as the principal source of funds for subprime mortgage loans and the resulting oversupply of mortgage finance helped accelerate the overheating of the housing market.

The subprime lending boom, driven by rising investor demand for private-label RMBS, fed into appreciating home values and vice versa, creating a fundamentally unstable spiral, dependent on runaway home prices. For home prices to keep going up, the pool of homebuyers

[14] Belsky, E.S. and Richardson N. 2010. "Understanding the Boom and Bust in Nonprime Mortgage Lending." Joint Center for Housing Studies, Harvard University.
[15] Principal-agent problem refers to the situation in which two parties with conflicting or misaligned interests operate under conditions of incomplete and asymmetric information.
[16] Gorton, G. 2008. "The Panic of 2007." NBER Working Paper No. 14358.

(borrowers) needed to keep expanding, not unlike a pyramid scheme.[17] Home prices surged, decoupled from their long-term historical trend, eventually pricing out a large number of potential home buyers, even with the lax underwriting standards that prevailed. As the expansion of the homebuyer pool reached its outer limits, continued home price increases became unsustainable. In the absence of home price appreciation, borrowers would eventually lose their ability to keep refinancing out of highly leveraged subprime ARMs.

The generalized euphoria of the boom years, regarding the true value and risk of RMBS, induced banks to leverage themselves in buying subprime securities. Structured investment vehicles (SIVs) were set up for that purpose as off-balance-sheet entities. SIVs' activities were financed by short-term borrowing at a rate linked to the interbank rate of interest (LIBOR). Funds raised by issuing short-term commercial paper were then invested in long-term assets, such as subprime RMBS (essentially, the very same strategy that sunk the MBB in the 1880s and the S&Ls in the 1980s).

At the peak years of the subprime boom, banks' off-balance-sheet SIVs had accumulated about $400 billion in mortgage securities, with a leverage ratio often at over 15-to-1.[18] SIVs were not regulated or insured like their sponsoring banks, and although they were "bankruptcy remote"[19] from their sponsors, they relied on the banks for backstop liquidity (even though this risk was not reflected on the banks' books) if they were unable to continuously roll over their short-term funding. Exactly this scenario played out, when RMBS' values in the SIVs' portfolios started to decline as the subprime crisis unfolded and the asset-backed commercial paper (ABCP) market dried out. When SIVs were unable to roll over their ABCP or sell due to increasing illiquidity of the purported liquid RMBS, they turned to their banks for the liquidity they needed. SIVs functioned as a transmitter and multiplier of the subprime crisis, as a number of banks had to transfer the assets of their SIVs back on their books, taking a substantial hit on their earnings in a short period that shook the foundation of the entire banking system.

The wider distribution of mortgage credit risk, at a global scale, was further facilitated by a higher level of financial engineering that added yet another layer of complexity, shrouding risks even more. The highly sophisticated financial instruments went under the name of collateralized debt obligations (CDOs), which pooled together mortgage securitizations (re-

[17] Levitin, A.J. and Wachter, S.M. 2010. "Explaining the Housing Bubble." Institute for Law & Economics Research Paper No. 10-15, University of Pennsylvania Law School.

[18] Belsky, E.S. and Richardson N. 2010. "Understanding the Boom and Bust in Nonprime Mortgage Lending." Joint Center for Housing Studies, Harvard University.

[19] A bankruptcy remote entity is a limited liability company whose operations are restricted to the acquisition and financing of specific assets. Due to the separate asset/liability structure and legal status as a subsidiary company, the insolvency of either the entity or its sponsor has little or no impact on the operations and obligations of the other.

securitization), sliced them into tranches arranged by seniority and sold them to investors. Senior tranches would pay lesser amounts of interest but would get paid first and be the last to be impacted by losses in case of any defaults in the underlying RMBS. Lower subordinate tranches would pay more interest but would be more at risk of losing money and get paid only when the senior tranches were fully paid. The CDO structure of prioritizing payments—usually referred to as the "cash flow waterfall"—and cushioning senior tranches from losses allowed for the high investment-grade ratings of the more senior tranches. While the CDOs' advantage was supposed to be the diversification in the underlying portfolios, the experience from the crisis showed that ability was overestimated. Also, the way in which expected defaults were modeled, turned out to make risks worse because the calculated default probabilities were extremely sensitive to assumptions that proved problematic,[20] due to the fact that CDO subprime collateral was rarely actively traded with publicly reported prices.

CDOs' popularity during the boom years helped transmit discounted risk to investors that could least bear it when problems emerged, proving the securities a lot less valuable and highly illiquid, precipitating and amplifying the crisis. Investors could not fully appreciate the risks they were assuming when they were investing in CDOs, as opacity as well as information asymmetry were an even greater issue than in the RMBS market. Whereas the collateral pool for an RMBS is composed of mortgage loans, a CDO's collateral pool is built with RMBS. If the modeling of cash flows of subprime RMBS was nearly impossible (even for the most sophisticated investor) due to scarce and timely quality data on the loans in their collateral pools, the modeling complexity for CDOs was higher by several multiples.[21]

Rating agencies were not immune in mistakenly underestimating the actual risks represented by CDOs, assigning AAA ratings to securities of far less certain credit quality. Overly optimistic credit ratings provided the support and the boost the subprime CDO market needed during the economic expansion, but also contributed to its quick collapse in the downswing as the rating agencies' modeling assumptions were shown to be flawed.

The presence of credit default swaps[22] (CDS) on securitization products like RMBS helped spread risk across markets through interlinkages in a process of financial contagion.[23] CDOs, faced with a rising investor demand, synthesized exposure to mortgage risk through CDS on

[20] The assumptions discounted risks because they were drawn from pricing differences in credit default swap markets during a period of appreciating home prices.
[21] Crouhy, M.G., Jarrow, R.A. and Turnbull, S.M. 2008. "The Subprime Crisis of 07." FDIC.
[22] A contract in which a CDS protection seller agrees to make a payment to a CDS protection buyer if some sort of credit event (such as bankruptcy) occurs.
[23] Longstaff, F.A. 2010. "The subprime credit crisis and contagion in financial markets." *Journal of Financial Economics* 97(2010)436–450.

mortgage securitizations, due to the lack of enough RMBS to construct collateral pools. This additional leveraging of the real RMBS helped multiply the impact of defaulting mortgages, well beyond actual notional values (RMBS' face value) increasing contagion and systemic risk.[24] Furthermore, the fact that less capital was needed to construct synthetic subprime CDOs with CDS as collateral fueled the rapid growth of CDO issuance during the boom years.

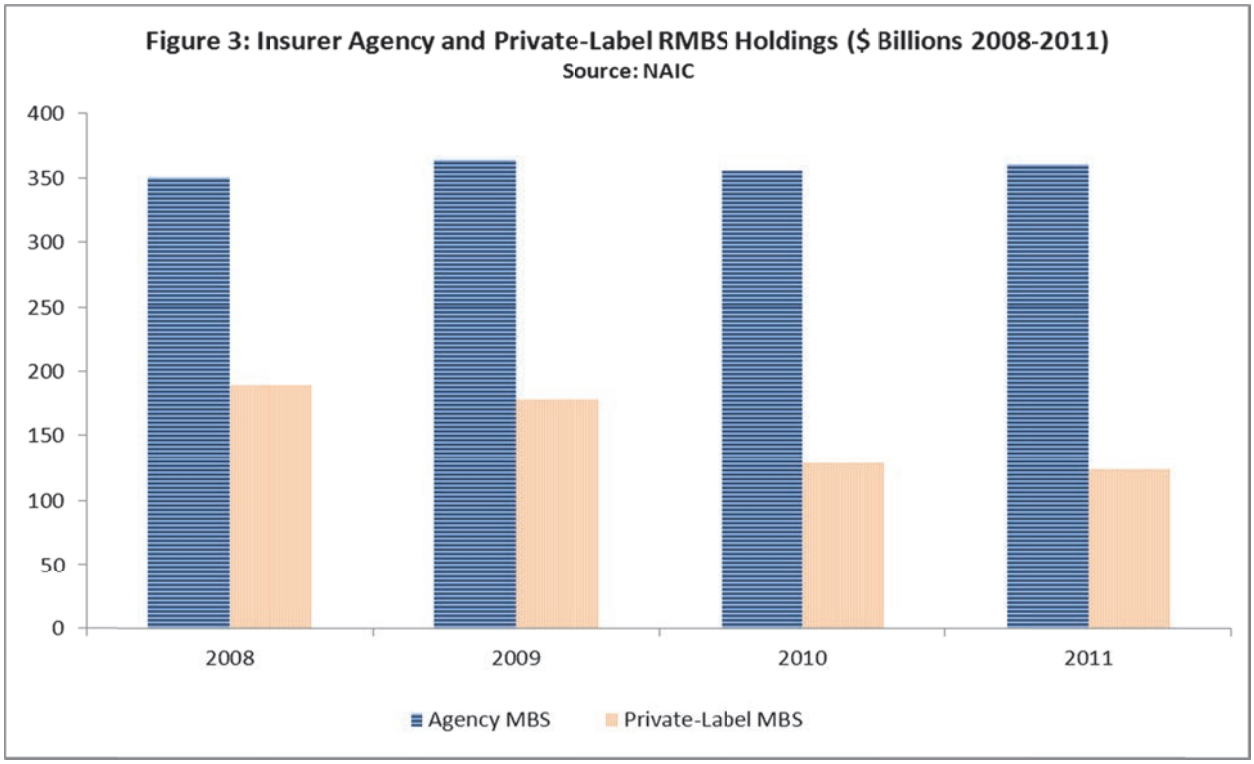
The complex interlinking of mortgage securitizations, CDOs and the CDS market gave rise to substantial loss of information making risks practically unknown to most, if not all, parties involved.[25] The lack of transparency along with fundamental uncertainty about the location, magnitude and quality of the risks resulted into a widespread loss of confidence that inevitably helped bring the capital market to its knees.

The key observations from the boom to bust of the housing and credit markets are the unsustainable amounts of leverage in the household and financial sectors, the loosening of underwriting standards, the layering of risks under impenetrable complexity and the dependence on a mortgage securitization market for generating lending capital. The mortgage securitization market became the central mechanism of a system that allowed the origination and proliferation of bad risk and helped spread it far and wide across the financial markets. What transpired in the RMBS market helped push the global capital markets toward a chaotic and punishing correction.

[24] Crouhy, M.G., Jarrow, R.A. and Turnbull, S.M. 2008. "The Subprime Crisis of 07." FDIC.
[25] Arestis, P. and karakitsos E. 2009. "Subprime Mortgage Market and Current Financial Crisis." Cambridge for Economic and Public Policy, University of Cambridge.

Insurer Exposure to RMBS

The U.S. insurance industry has historically been an important institutional investor in residential mortgage-backed securities. Although Insurers have shown over the years a preference for agency RMBS, they have also maintained a significant exposure to private-label mortgage securities. As of year-end 2011, insurers held a total of $483 billion in RMBS, with Fannie Mae, Freddie Mac, and Ginnie Mae mortgage-related securities accounting for nearly 75 percent (Figure 3). The increase in the overall share of agency RMBS in insurers' aggregate portfolio since 2008, is almost entirely due to the declining private-label holdings in the post-crisis period (Figure 3). By year-end 2011, private-label RMBS had shrunk to about 25 percent of the total industry exposure from approximately 35 percent four years earlier (2008 year-end).



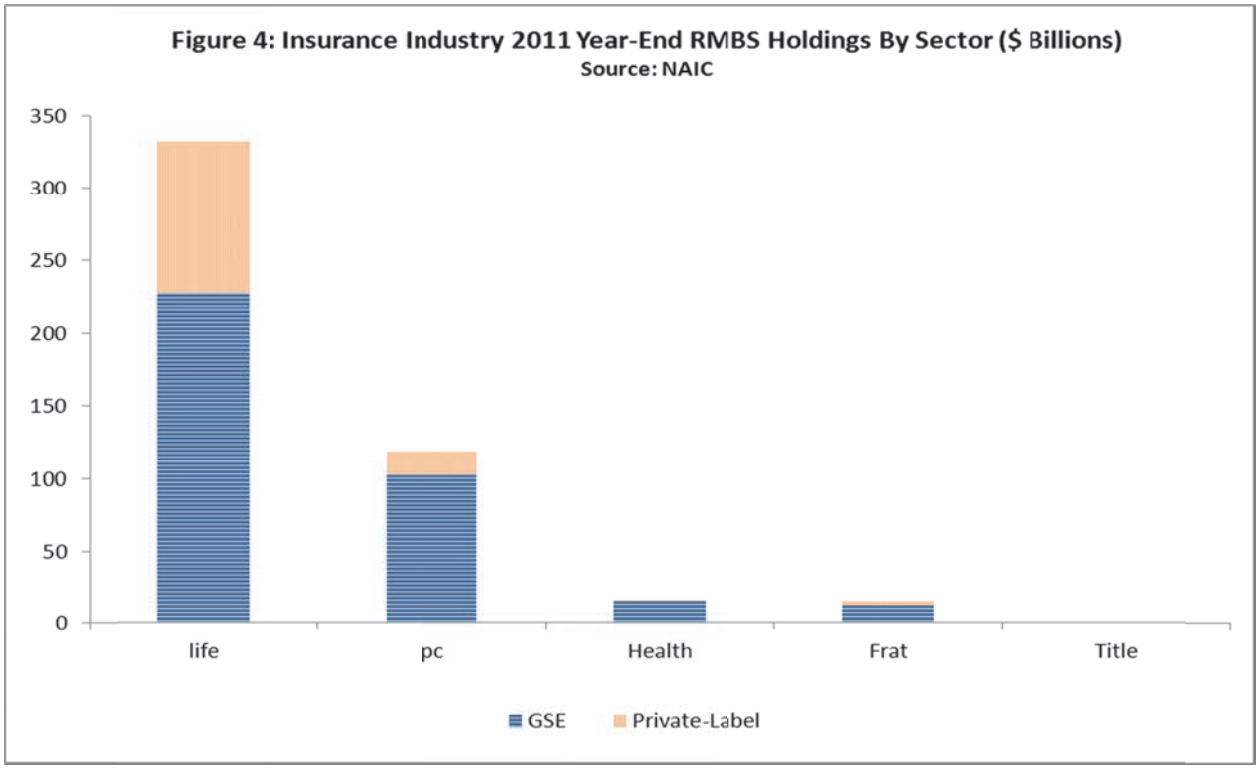
The drop in private-label holdings during the period 2008-2011 is not unexpected, given that there has been almost no new issuance in the past few years. Meanwhile, existing private-label investment declined due to disposal activity, amortizations and selected revaluations as a result of ongoing credit concerns.

Life insurers are heavily invested in RMBS as part of their overall investment in structured securities due to their traditionally higher yields than similarly rated corporate bonds. Mortgage-backed deals were also attractive because they could be tailored through the

investment structuring process to meet specific investor needs for duration and interest rate sensitivity. Furthermore, it is worth noting that life companies have been attracted to the longer-dated portion of RMBS cash flows, as they provide a better match to their longer liability profile.

Until the eruption of the financial crisis, the vast majority of RMBS—agency and private-label alike—were considered high-quality investments and they were rated accordingly by the credit rating agencies. Insurers, before the crisis, typically only needed to be concerned about the cash flow volatility of non-agency RMBS resulting from changing mortgage prepayment rates, and not about credit quality issues.

Life insurance companies have a greater RMBS exposure (69 percent of the industry total) than their property/casualty counterparts, while health, fraternal and title insurers held only a relatively small fraction (about $32 billion or nearly 7 percent) of the industry total in 2011 (Figure 4).



The insurance industry held about $123 billion in current carrying value of non-agency or private-label RMBS as of year-end 2011, slightly down from the prior year's $128 billion but a 35 percent drop from year-end 2008 (Table 1). Despite the decline in absolute numbers, insurers' involvement in the private-label RMBS market remained significant. Based on the total private-label RMBS outstanding of $734 billion as of the end of 2011, according to the Securities

Industry and Financial Markets Association, insurers' slice of the market amounted to about 17 percent.

Table 1: Insurance Industry Private-Label RMBS Holdings By Sector (Millions 2008-2011)
Source: NAIC

Sector	Year-End 2008	Year-End 2009	Year-End 2010	Year-End 2011
Life	$154,458	$125,824	$109,784	$104,144
P&C	$29,796	$20,352	$14,371	$15,768
Fraternal	$2,458	$3,633	$3,121	$2,518
Health	$2,244	$1,250	$819	$646
Title	$23	$4	$3	$1
Total	**$188,979**	**$151,062**	**$128,097**	**$123,077**

Among the factors for the decline in insurers' private-label RMBS holdings, is the write-offs on these securities that companies have taken, and the lack of new issuance, which means that scheduled and unscheduled principal payments cannot be offset by purchases of new non-agency securities.

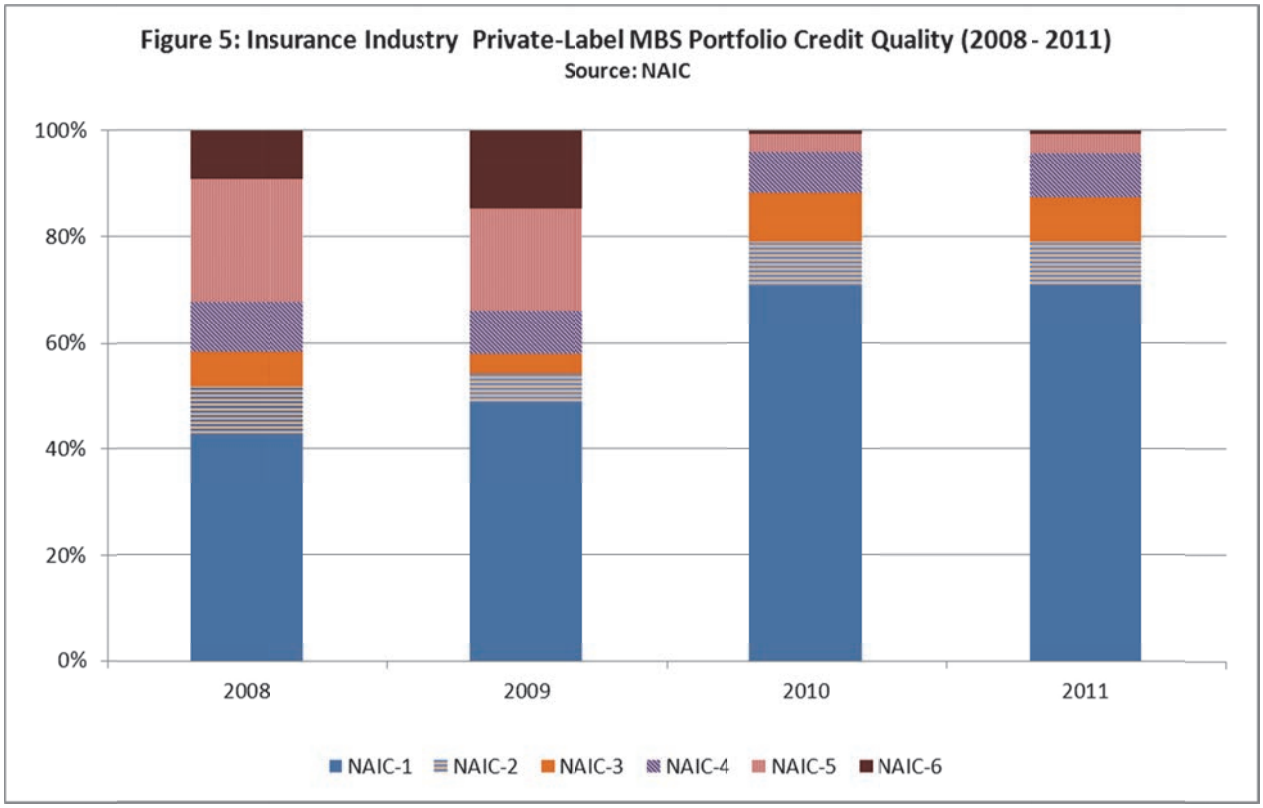
The par amount of the 2011 year-end industry exposure was considerably greater, at $151 billion, as insurance companies have taken substantial write-offs in RMBS since the financial crisis began. Also, insurers increased their RMBS acquisitions in 2011 at relatively deep discounts. The industry has taken almost $30 billion in other-than-temporary impairments (OTTI) and unrealized valuation decreases just during the four-year period from year-end 2008 to year-end 2011 (Table 2). Other-than-temporary impairments and fair value revaluations taken during the year totaled $2.9 billion in 2011, compared with $2.8 billion in 2010 and almost $15 billion in 2009 (Table 2).

Table 2: Insurer Private-Label MBS Other-Than-Temporary Impairments Recognized and Unrealized Valuation Decreases ($ Millions)
Source: NAIC

2008	$9,291
2009	$14,691
2010	$2,787
2011	$2,888
Total	**$29,657**

As the turmoil in the housing and credit markets intensified, the credit quality of insurers' private-label RMBS portfolio suffered greatly. As of the end of 2008, the investment-grade

(NAIC-1 and NAIC-2) RMBS amounted to barely over 50 percent of the aggregate portfolio. Securities designated NAIC-5 and NAIC-6 constituted a significant 32 percent of the total industry private-label portfolio. In 2009, there was a small improvement, despite the continuing mass downgrades, due to the introduction of a new valuation methodology. By 2010 year-end, the new designations, based on the new methodological criteria, reflected a more accurate quality assessment of insurers' private-label portfolio. According to the new methodology, close to 80 percent of the RMBS held by insurers were designated NAIC-1 and NAIC-2 (Figure 5). The same valuation process applied in 2011, positively impacting year-end credit designations and insurers' RBC calculations.



Challenges to Mortgage Insurers and Financial Guarantors

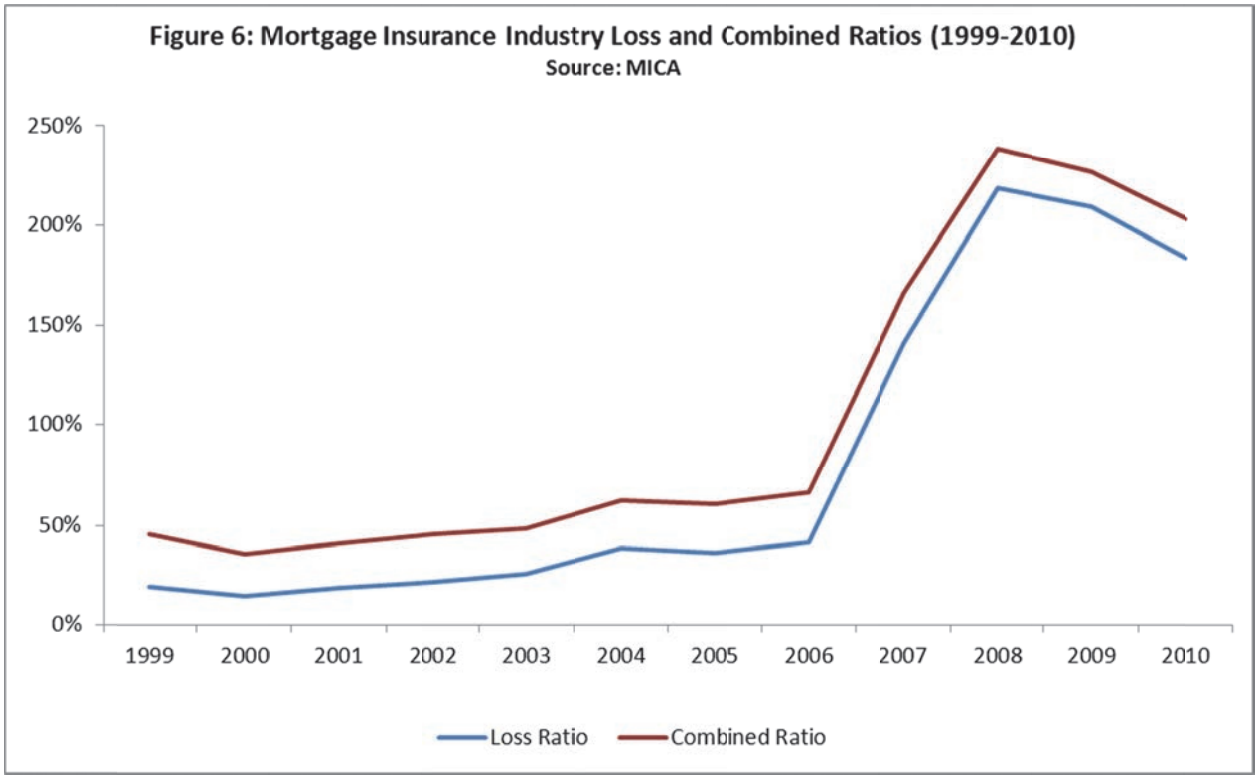
Mortgage Insurers

The financial crisis found private mortgage insurers exposed on the front lines as they were directly underwriting the risk of borrowers defaulting on their mortgage loans. Particularly, since mortgage insurers provided coverage on high loan-to-value mortgages with very thin equity slices, they were vulnerable to potential losses in the event of rising delinquencies and defaults. While mortgage insurers avoided many of the now worst-performing loans during the credit boom, they still added significant exposure to mortgage risk, including material subprime exposure.

Mortgage insurers' shift toward "affordability" products and subprime loans increased their exposure to the rise in mortgage defaults during the crisis. Insurance for adjustable rate products jumped from 13 percent at year-end 2001 to about 25 percent at year-end 2006, while subprime loans made up about 12 percent of the industry aggregate risk-in-force.[26]

The private mortgage insurance industry recorded its best year in terms of new insurance volume in 2007, with total new insurance written exceeding $300 billion for the first time.[27] A short two years later, new insurance written had declined to $81 billion as the market for mortgage insurance shrunk, following the collapse of the housing market and the subprime crisis. As home prices plummeted, the wave of mortgage defaults and home foreclosures weakened mortgage insurers' capital position and resulted in substantial losses. Having to set aside substantial capital to cover future claims severely constrained mortgage insurers' ability to write new business. The very challenging market conditions that the mortgage insurance industry experienced since the eruption of the crisis are reflected in the sharp rise of the industry's loss and combined ratios (Figure 6). The industry's loss ratio (losses over net premiums earned) jumped from 41 percent in 2006 to a record high 218 percent in 2008[28] (Figure 6).

[26] Moody's Investors Service. 2007. "An Examination of Subprime Mortgage Risk Exposure Among the U.S. Mortgage Insurers." *Moody's Special Comment,* Report Number: 103493.
[27] Mortgage Insurance Companies of America (MICA). 2011. "2011–2012 Fact Book & Member Directory."
[28] Mortgage Insurance Companies of America (MICA). 2011. "2011–2012 Fact Book & Member Directory."



Although market and economic trends appear to have generally stabilized in the last couple of years, this trend has not yet helped mortgage insurers to materially improve their financial situation. As Table 3 shows, losses paid are still very high compared to 2007, even though there was some minor improvement recorded in 2011. Poor industry results could be partly attributed to the losses of two insurers, PMI Mortgage Insurance Co. (PMI) and Republic Mortgage Insurance Co. (RMIC), which were placed under state supervision due to mounting losses and the resultant capital shortfalls.

Table 3: Mortgage Insurance Industry Losses Paid
Source: NAIC

	Direct Losses Paid	Assumed Losses Paid	Gross Losses Paid
2011	$10,416,059,973	$2,198,227,551	$12,614,287,524
2010	$10,570,222,861	$2,281,222,154	$12,851,445,015
2009	$6,933,566,984	$1,154,718,899	$8,088,285,883
2008	$4,793,009,346	$690,608,943	$5,483,618,289
2007	$2,453,039,848	$391,867,064	$2,844,906,912

Mortgage guarantors' reported losses in 2011 were still at high levels, stressing their already weakened capital positions. According to Standard & Poor's, the losses generated from the

insurers' 2005-2007 books of business still outweigh any profits that have resulted from newer, higher credit quality business.[29]

The underwriting experience for mortgage insurers over the past five years (2007-2011) is shown below in Table 4. Premiums in 2007 and 2008 climbed to historical highs, buoyed by the rapidly expanding housing market. With the collapse of the housing market, underwriting slumped by almost 30 percent between the peak year (2008) and 2011 (Table 4).

Table 4: Mortgage Insurance Premiums Written
Source: NAIC

	Direct Business	Assumed From Affiliates	Assumed Non-Affiliates	GPW
2011	$4,575,007,663	$665,025,082	$11,363,025	$5,251,395,770
2010	$4,877,789,480	$699,799,425	$25,782,747	$5,603,371,652
2009	$5,435,412,551	$822,166,447	-$314,224	$6,257,264,774
2008	$6,428,269,678	$969,194,059	$41,176,274	$7,438,640,011
2007	$6,152,079,536	$815,329,378	$30,708,553	$6,998,117,467

The cushion provided by contingency reserves that mortgage insurers are required to maintain against catastrophic losses during an economic crisis has thinned considerably over the last five years. These reserves are built during good times and drawn only in the event losses exceed certain statutory thresholds or otherwise directed by state regulators. Although the structure of capital requirements for mortgage insurers was more stringent, it still proved inadequate given the wholesale meltdown. What once was a very comfortable cushion seems to be near depleted through the financial crisis and needs to be built back up. The aggregate contingency reserves of the mortgage insurance industry shrunk more than 95 percent in the period between 2007 and 2011 (Table 5).

Table 5: Mortgage Insurance Contingency Reserves
Source: NAIC

	Contingency Reserves
2011	$614,919,737
2010	$615,085,780
2009	$2,883,196,988
2008	$7,142,932,962
2007	$13,414,066,415

[29] Standard & Poor's. 2012. "U.S. Mortgage Insurer Sector Outlook Remains Negative – And The Clock's Ticking." *RatingsDirect on the Global Credit Portal*, March 1, 2012.

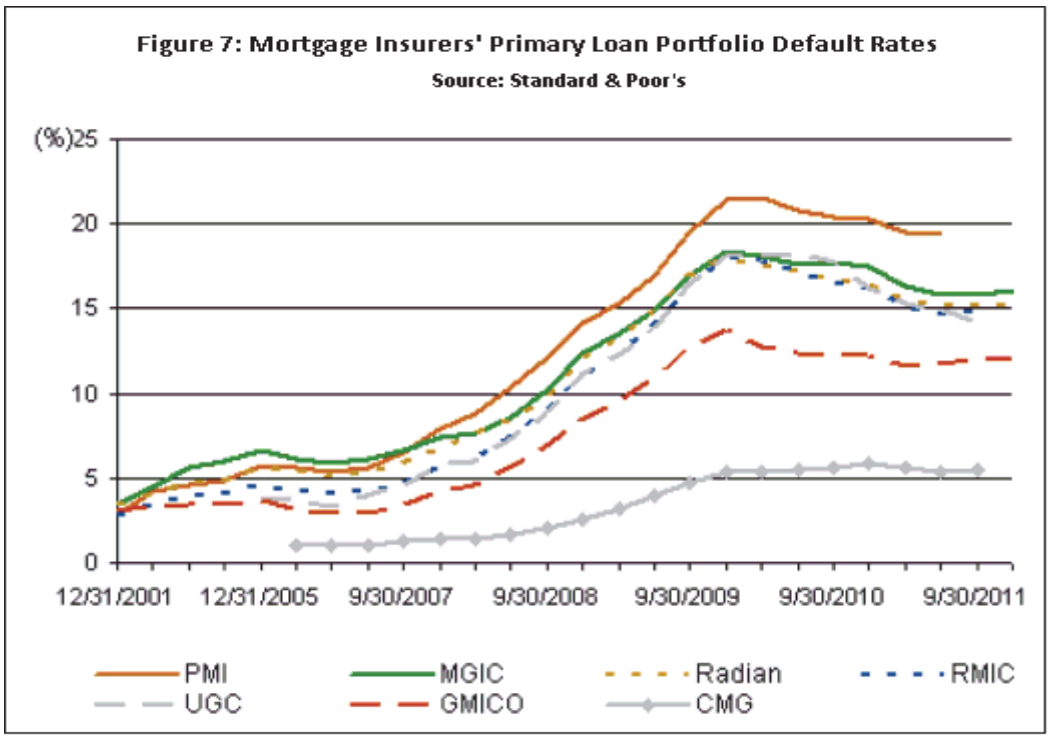
As of March 2012, both Standard & Poor's and Moody's have rated mortgage insurers BBB (Baa) and below while they have maintained a negative outlook for the industry for the rest of 2012 and possibly well into 2013 (Table 6). Credit rating agencies believe that new business writings will not be sufficient to offset expected losses into 2013.

Table 6: Mortgage Insurance Company Credit Ratings
Sources: Standard & Poor's, Moody's

	Financial Strength Rating (March 2012)		Financial Strength Outlook (March 2012)	
Company	S&P	Moody's	S&P	Moody's
Genworth Mortgage Insurance Corporation (GMICO)	B	Ba1	Negative	Negative
Mortgage Guaranty Insurance Corp. (MGIC)	B	B1	Negative	Negative
PMI Mortgage Insurance Co. (PMI)	Regulatory Supervision	Caa3	N/A	Negative
Radian Guaranty Inc.	B	Ba3	Negative	Under Review for Downgrade
Republic Mortgage Insurance Company (RMIC)	Regulatory Supervision	Withdrawn	N/A	N/A
United Guaranty Residential Insurance Co. (UGRIC)	BBB	Baa1	Stable	Stable
CMG Mortgage Insurance Co. (CMG)	BBB	N/A	Negative	N/A

Although the 2005–2007 vintage loans in mortgage insurers' books have shown some signs of delinquency burnout, default rates have remained at elevated levels, causing significant losses[30] (Figure 7). While in the medium term the run-off of the legacy risk will help improve the quality of mortgage insurers' portfolios, rating agencies expect default rates to remain at these high levels even beyond 2013.

[30] Standard & Poor's. 2012. "U.S. Mortgage Insurer Sector Outlook Remains Negative – And The Clock's Ticking." RatingsDirect on the Global Credit Portal, March 1, 2012.



At the same time, as the economy and the housing market recover, the performance of at least the better-capitalized insurers should show gradual improvement. The mortgage insurance industry's future prospects hinge, in great part, on the changes in the mortgage finance system, and especially on the future status and role of the GSEs. For the time being, given mortgage insurers' weakened position, the market still largely relies on the Federal Housing Administration for insurance.[31]

The possible winding-down of GSEs' operations could potentially shift credit risk to the private sector, which might enhance mortgage insurers' role in the housing finance market by increasing the reliance on mortgage insurance.[32] On the other hand, the issuance of the credit risk retention proposal in 2011,[33] allowing the exemption of qualified residential mortgages (high credit quality) from risk retention requirements if they include a 20 percent down payment (allowing mortgage originators to avoid retaining a portion of the risk being securitized), could adversely impact the mortgage insurers' current business model.[34]

[31] Standard & Poor's. 2012. "U.S. Mortgage Insurer Sector Outlook Remains Negative – And The Clock's Ticking." RatingsDirect on the Global Credit Portal, March 1, 2012.
[32] Moody's Investor Service. 2012. "US Mortgage Insurers: Negative Outlook." Industry Report Number:139915. March 7, 2012.
[33] U.S. Securities and Exchange Commission. 2011. "Credit Risk Retention." 17 CFR Part 246. Release No. 34-64148; File No. S7-14-11.
[34] Standard & Poor's. 2012. "U.S. Mortgage Insurer Sector Outlook Remains Negative – And The Clock's Ticking." RatingsDirect on the Global Credit Portal, March 1, 2012.

Financial Guarantors

The bursting of the housing bubble and the collapse of the subprime securitization market has left the financial guaranty industry (commonly referred to as bond insurance) in disarray, dramatically narrowing its business opportunities and threatening its viability. Financial guarantors' foray into structured finance that started in the late 1990s—during which they offered guarantees of structured financial products tied to the performance of the housing and mortgage market—is largely the reason that they are in their current distressed situation. Aggregate levels of credit insurance against mortgage-backed securities strained bond insurers' finances, often reaching several multiples of their claims-paying ability.[35] If that was not enough, financial guarantors are also exposed to the distress in the securitization market through their portfolio investments, as they levered their insurance exposure by investing substantial amounts of their own capital.

As the issuance of private-label mortgage structured-products that involve credit enhancement has dwindled, financial guarantors have little opportunity to recover their business, especially as their penetration of the municipal market (their traditional business) remains at a fraction of historical levels. The longer the private-label mortgage securitization market stays in the doldrums, the harder it would be for financial guarantors to regain that market, as it is likely that the market need for credit enhancements will force the design and establishment of new alternatives to financial guarantees.

In the post-crisis environment, the value of bond insurance has declined considerably as institutional investors see little actual value to the product. Furthermore, guarantors' higher risk profiles, reflected by their credit ratings (March 2012), have seriously eroded the value that is assigned to their insurance (Table 7). As their business model is almost exclusively based on "passing" their own credit ratings, through their guarantees, to other parties (securitizations and municipal debt), not having AAA ratings has significantly narrowed both market size and risk premiums. Actually, securities insured (wrapped) by financial guarantors now trade equivalent with similar securities that have no insurance. According to Moody's, insurance could likely become more meaningful only in cases where the underlying credit is very distressed.[36] Currently, with the flow of securitizations having slowed to barely a drip and with only one bond insurer (Assured Guaranty Corp.) actively underwriting, the immediate prospects of the sector are bleak.

[35] Schich, S, 2008. "Challenges Related to Financial Guarantee Insurance." *Financial Market Trends,* OECD, 2008.
[36] Moody's Investor Service. 2012. "Financial Guaranty Insurance: Negative Outlook. Narrower Market Opportunities and Uncertain Portfolio Losses." Industry Report Number: 138315. April 26, 2012.

Table 7: Financial Guarantor Credit Ratings Sources: Standard & Poor's, Moody's				
	Financial Strength Rating (March 2012)		Financial Strength Outlook (March 2012)	
Company	S&P	Moody's	S&P	Moody's
Assured Guaranty Corp.	AA-	Aa3	Stable	Review Down
MBIA Corp.	B	B3	Negative	Review Down
National Public Finance Guaranty Corp.	BBB	Baa2	Developing	Negative
Radian Asset Assurance Inc.	B+	Ba1	Negative	Negative
Syncora Guarantee Inc.	NR	Ca	NR	Developing
Berkshire Hathaway Assurance Corp.	AA+	Aa1	Negative	Stable

Losses from their legacy book are still evolving, especially from securities linked to residential mortgages. Moody's estimates that while guarantors' exposure is running off (some were commuted) it still remains considerable. As of year-end 2011, Assured Guaranty's structured book totaled $116 billion of which $21.6 billion was in insured MBS. MBIA had $14.2 billion gross par outstanding of insured MBS in the same period.[37] Also, the fact that guaranty insurers maintain large single issuer concentrations makes them more vulnerable to potentially very large losses, especially if the recovery runs out of steam and the economy takes a turn for the worse.[38] Assured Guaranty is exposed to large (more than $500 million net par) RMBS policies subject to claims.

The market's confidence in bond insurers is further shaken by their restructuring efforts and litigation problems. Ambac is paying claims from its general account but not from its segregated account, where distressed and other structured and public finance risks have been placed (Ambac's parent company filed for bankruptcy in November 2010). CIFG is still paying claims after it reinsured most of its municipal bond portfolio with Assured and commuted most of its structured risks. Syncora is paying claims after restructuring and other remediation measures it took in 2010. Claims payments are still suspended for Financial Guaranty Insurance Company (FGIC), which filed for bankruptcy in August 2010. FGIC has also filed lawsuits against MBS issuers alleging they fraudulently induced FGIC into insuring their securities. MBIA and its bank counterparties have been in litigation since the separation of MBIA Insurance Corp. and National in early 2009. Although the insurer has not written any significant new business since 2008, it continues to pay claims.

[37] Moody's Investor Service. 2012. "Financial Guaranty Insurance: Negative Outlook. Narrower Market Opportunities and Uncertain Portfolio Losses." Industry Report Number: 138315. April 26, 2012.
[38] Moody's Investor Service. 2012. "Financial Guaranty Insurance: Negative Outlook. Narrower Market Opportunities and Uncertain Portfolio Losses." Industry Report Number: 138315. April 26, 2012.

Regulatory Framework Changes in Response

The financial crisis and the collapse of the housing market greatly impacted the mortgage-backed market, as delinquency and loss performance of RMBS rapidly deteriorated to a degree that far exceeded the level of default expectations of credit rating agencies. By the time rating agencies reacted to the apparent inadequacies of their modeling processes to adjust to the new market realities, an unprecedented massive ratings correction was necessary. The loss of market confidence on NRSRO credit ratings and the aggressive downgrading actions that followed, directly impacted insurers' RMBS investment portfolios and the assessment of their risk-based capital (RBC) charges which are tied to NAIC designations mapped to NRSRO credit ratings.

While AAA-rated securities traditionally have had less than 1 percent probability of defaulting, accelerated events during the financial crisis led to unforeseen substantial losses for the vast majority of AAA-rated RMBS, with some failing outright. By the middle of 2009, credit ratings of MBS had plummeted and the issuance of new mortgage securitizations had stalled. Following NRSROs' radical revisions of their RMBS loss expectations (often revised to 20 times as high as the original loss estimates), and their downgrades of nearly 70 percent of all originally AAA-rated securities to non-investment grade levels (CCC or below), questions were raised about the extent of regulatory reliance on credit ratings. A key piece of the Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010 is the elimination of credit ratings from financial regulation.

The NAIC through its Securities Valuation Office (SVO) has its own credit rating scale, running from NAIC-1 (lowest risk) to NAIC-6 (highest risk, near or at default). All securities in insurers' portfolios use these designations and their related factors to assess solvency capital requirements. While the SVO still evaluates non-rated securities and assigns appropriate risk designations, all rated securities, including RMBS and other securitizations prior to the crisis, had designations mapped directly to NRSRO ratings.

As of year-end 2008, the insurance industry held close to $190 billion in RMBS of which about $154 billion were in life insurers' portfolios. The massive rating downgrades of RMBS during 2009 caused a huge negative rating migration of the industry's aggregate RMBS portfolio in terms of credit quality. While at year-end 2008, about 84 percent of insurers' total RMBS holdings carried NAIC-1 designations (83 percent for prime RMBS and 85 percent for subprime) (Table 8), by November 2009, only close to 44 percent of the mortgage securities in the same portfolio were designated NAIC-1 (41 percent for prime and 47 percent for subprime) (Table 9). The downgrades were so severe that more than 22 percent of insurers' RMBS portfolio was in the NAIC-5 designation and 9 percent in the highest risk NAIC-6 designation (Table 9).

Table 8: U.S. Insurer 2008 Year-End RMBS Holdings by NAIC Designation
(Designations as of 2008 Year-End)
Source: NAIC

As Percentage of Book Adjusted Carrying Value

RMBS Type	Industry	NAIC-1	NAIC-2	NAIC-3	NAIC-4	NAIC-5	NAIC-6
Prime	Life	82.58%	8.26%	3.74%	3.30%	1.75%	0.37%
	PC	84.81%	9.46%	2.57%	2.20%	0.60%	0.35%
	Others	89.11%	6.15%	2.45%	1.37%	0.82%	0.10%
	Prime Total	83.10%	8.41%	3.52%	3.08%	1.54%	0.36%
Subprime	Life	84.80%	6.77%	3.95%	2.70%	1.57%	0.20%
	PC	87.76%	6.71%	2.23%	2.08%	0.92%	0.30%
	Others	84.96%	9.90%	1.75%	1.51%	1.14%	0.74%
	Subrime Total	85.22%	6.85%	3.65%	2.58%	1.47%	0.23%
RMBS Total		**84.20%**	**7.60%**	**3.59%**	**2.82%**	**1.50%**	**0.29%**

Table 9: U.S. Insurer 2008 Year-End RMBS Holdings by NAIC Designation
(Designations as of November 2009)
Source: NAIC

As Percentage of Book Adjusted Carrying Value

RMBS Type	Industry	NAIC-1	NAIC-2	NAIC-3	NAIC-4	NAIC-5	NAIC-6
Prime	Life	40.92%	9.33%	6.98%	9.69%	23.87%	9.21%
	PC	38.82%	7.43%	4.80%	12.20%	26.83%	9.91%
	Others	38.39%	12.63%	6.18%	11.12%	22.35%	9.33%
	Prime Total	40.51%	9.10%	6.61%	10.13%	24.32%	9.33%
Subprime	Life	47.15%	8.66%	6.44%	9.13%	19.65%	8.96%
	PC	47.12%	7.88%	6.69%	8.30%	22.62%	7.38%
	Others	43.45%	8.54%	6.18%	9.50%	24.50%	7.83%
	Subrime Total	47.05%	8.55%	6.47%	9.03%	20.19%	8.71%
RMBS Total		**43.91%**	**8.82%**	**6.53%**	**9.56%**	**22.17%**	**9.01%**

Continued reliance on NRSRO ratings for year-end 2009 designations would have resulted in a nearly six-fold increase in life insurers' RBC for mortgage-backed securitizations (Table 10). RBC charges for life insurers would have jumped from about $2 billion to more than $14 billion. The extent of credit quality deterioration for RMBS becomes even more obvious when it is compared to other investments. Other structured deals, including asset-backed and commercial

mortgage-backed securities, experienced a less-dramatic increase of 110 percent in RBC, while corporate bonds had an even more modest increase of just 35 percent (Table 10).

Table 10: Life Insurer RBC Charge Increase Based on YE 2008 Holdings According to YE 2008 and November 2009 Designations
Source: NAIC

Type of Invested Asset	RBC % Increase
RMBS	573.05%
Other Structured*	110.03%
Corporate	35.33%

The huge impact that the NRSRO ratings-based regulatory process for determining RBC had on insurance companies, along with the recognition of the data and methodological shortcomings that rendered NRSRO credit ratings inaccurate, necessitated the development for an alternative methodology.

The alternative approach that was adopted involved a new process to enable a more precise assessment of the value of RMBS held by insurers. Mortgage securitizations are very complex instruments and there is not one simple way to model their expected performance. Also, as both the mortgage markets and the securitization instruments became more complex, the models themselves got more complicated and increasingly esoteric. Alas, history and science suggest that as complexity increases, reliability and accuracy tend to decrease commensurately.

Furthermore, as market-based measures tend to underestimate it during economic expansions, the generalized discounting of risk also played a role in rating agencies' assessment of RMBS credit quality. Credit rating agencies have historically tended to underestimate the default probability of securities, during the upward phase of the business cycle, partly due to a contemporaneous market mispricing of both assets and risks (rising asset values and decreasing measures of risk), especially in periods of excessive credit growth. The built-in cyclicality of credit ratings, with upgrades increasing during the expansion and downgrades decreasing during the subsequent contraction, can potentially turn quite extreme, with the highest peaks followed by the deepest troughs, if the models turn out to be inadequate.

The development of an RMBS valuation model requires the combination of profound knowledge and understanding of housing and mortgage markets and of technical sophistication of quantitative modeling. Most models, including those of rating agencies, used only current data to base their estimates of future home prices, and they heavily discounted the possibility of a nationwide decline of home values (a good deal of subjective judgment goes into a model).

But, new, improved modeling approaches, armed with the knowledge of the recent historical experience, should, in theory, place regulators in a position to better estimate future prices, delinquencies and loss severities.

The new approach for the valuation of insurer-held non-agency RMBS called for modeling each individual holding from a universe of 22,000 securities for filing year 2009. The same process was repeated for year-end 2010 and 2011 (for a total of approximately 19,000 securities), with each security modeled for expected losses using five different macroeconomic scenarios. The baseline for these scenarios was developed in conjunction with third-party macroeconomic forecasting firms, using a set of assumptions and probabilities that reflect consensus on current market conditions while stressing it to best estimate meaningful differences in valuation across all scenarios.

With each mortgage-backed deal modeled under upside and downside scenarios, a benefit was the capture of information or data characteristic of where a security may have low losses under a single scenario but experience significant losses under slightly more stressful scenarios. Losses under each scenario for a security were weighted based on its probability.

For year-end 2009, five probability weighted scenarios ranging from 33 percent to 61 percent peak-to-trough home price decline were used. These home price appreciation (HPA) scenarios were generated using a Monte Carlo simulation to generate different HPA paths around the base case using historical volatility. Base case represents a median scenario with a high probability while the most extreme scenarios have a very low probability. The most conservative scenario selected represents a very severe scenario to capture the downside with "tail risk". Forward-looking interest rates are also a primary dynamic variable in the model and were generated based on the forward curve.

For year-end 2011 RMBS modeling, the most conservative (extreme) scenario, assumes continued declines in house prices through the decade with a peak-to-trough decline of 59 percent (with Q3 of 2022 the timing of the trough). The most aggressive scenario assumes the trough was in the first quarter of 2011 (for total decline of 33 percent from the peak) and sees a recovery in prices for the next three years (Table 11).

Table 11: Scenario Assumptions for Year-End 2011 RMBS Modeling Source: NAIC				
	Probability	Timing to Trough	Peak to Trough HPA	Peak to 12/15 HPA
Most Aggressive	5%	Q1 2011	-33%	13%
Aggressive	20%	Q1 2011	-33%	-5%
Base Case	55%	Q1 2012	-35%	-21%
Conservative	20%	Q3 2013	-38%	-35%
Most Conservative	5%	Q3 2022	-59%	-45%

The estimated expected losses, discounted at the security yield, are used to calculate each security's intrinsic price.[39] The intrinsic price is then applied to translate expected loss ranges (based on the five scenarios) into carrying price[40] ranges for each NAIC designation. Insurers use these carrying prices by reference to their carrying values for that MBS to determine the appropriate designation and apply the corresponding RBC factor.

As part of quality assurance, statistical analysis is conducted at the pool level and the tranche level of mortgage securities to project the performance of each deal, while identified outliers are subjected to further analysis for any "systemic significance."

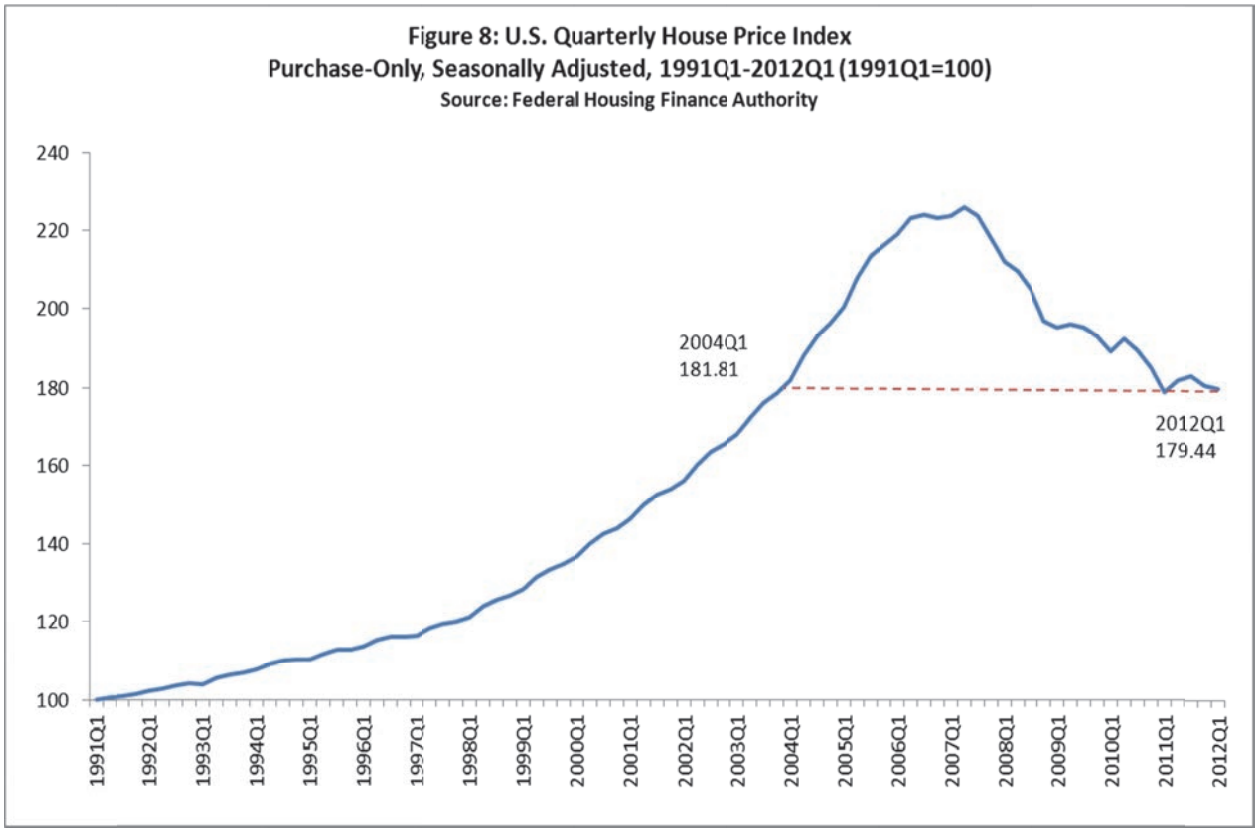
A small percentage of non-agency RMBS were not modeled for different reasons. These non-modeled securities included interest-only strips, foreign transactions and some highly complex re-securitizations. For these deals, insurance regulators continue to rely on NRSRO ratings, but factored in carrying values in comparison to a fixed matrix of values.

[39] Intrinsic price is defined as the difference between par value and expected principal losses discounted at a Security Yield (typically Coupon rate at origination).

[40] Carrying Price is defined as the insurer's carrying value divided by the security's par value, multiplied by 100. To translate the expected loss ranges into carrying price ranges, the Intrinsic Price is divided by 1 minus the minimum and maximum expected loss for each range.

What Does the Future Hold?

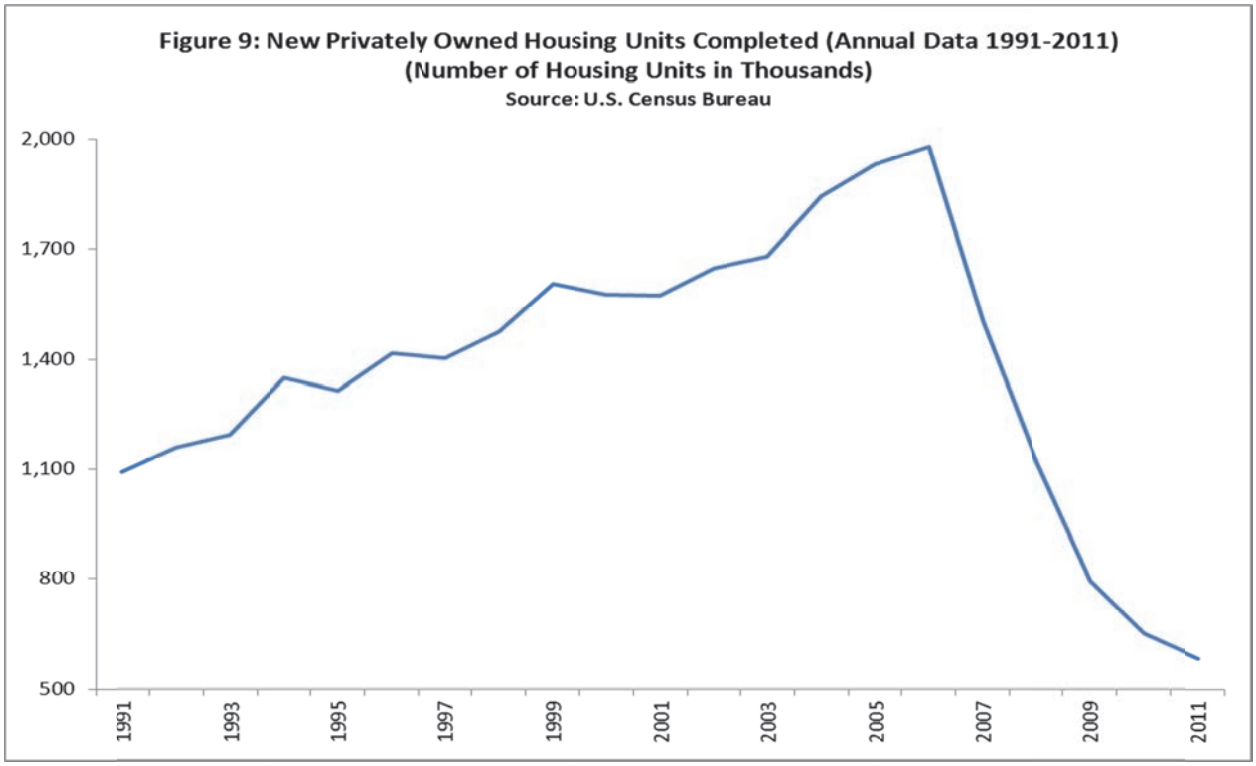
Five years into an unprecedented housing downturn, the market has started showing some signs of stabilization, but the U.S. index[41] is still 17.6 percent below its April 2007 peak and it stands (as of the first quarter of 2012) at roughly the same level as in the beginning of 2004[42] (Figure 8).



With foreclosures and defaults continuing to weigh heavily on the market, and with home construction running at about one third of its long-run equilibrium and one fourth of boom year levels, a full recovery back to peak levels is far from certain (Figure 9). Any significant improvement in the housing market must almost axiomatically be preceded by a much needed net worth and credit rebuilding which in turn directly depends on the strength of the economic recovery.

[41] The FHFA monthly index is calculated using purchase prices of houses backing mortgages that have been sold to or guaranteed by Fannie Mae or Freddie Mac.

[42] *Federal Housing* Finance Agency. 2012. News Release. June 21, 2012



In this setting, it is a really formidable task for the securitization market to regain its strength and dynamism to be able to revitalize the flow of credit. The fact the pre-crisis housing finance system, and especially its securitization component, have been blamed for the global financial crisis does not preclude the need for a working, vibrant and efficient mortgage securitization market. The work to restructure the market, informed by serious analytical work, continues and its future will be determined by difficult policy decisions over the next few years.

The Future of GSEs

With GSEs, still in conservatorship, controlling about 95 percent of mortgage origination and securitization following the collapse of private-label securitization, their fate is directly linked to efforts for the stabilization of macroeconomic and housing policy.[43]

A number of economists and analysts propose strengthening of the GSEs' role while maintaining strong government support. They believe it provides the best answer to the crisis and the most cost-effective and efficient way to sustain the secondary mortgage market.[44] The Federal Government recognizes it has an important role in housing finance and must provide support for the GSEs. However, the Federal Government would prefer the private markets—subject to strong regulatory oversight and transparent standards for consumer and investor

[43] Gabriel, S.A. 2012. "Mortgage Financing Beyond the GSEs." *Conference on Bank Structure and Competition,* Federal Reserve Bank of Chicago, May 2012.
[44] Baker, D. 2010. "Fannie and Freddie Live Public or Die." *The Guardian*, August 23, 2010.

protection—as the primary source of mortgage credit and bearer of the burden for potential losses. The Obama Administration, in consultation with FHFA and Congress, is working to appropriately restrict the areas of mortgage finance in which Fannie Mae, Freddie Mac, and the FHLBs operate, so that overall government support is substantially reduced.[45]

The potential policy options for the GSEs range from (a) government-driven solutions like returning the agencies to their pre-crisis status and role, incorporating the GSEs' functions into a federal agency or creating a public utility model in which the government regulates the GSEs' profit margin, sets guarantee fees, and provides explicit backing for GSE commitments to (b) privatization of the GSEs starting from converting the agencies' corporate purpose to being providers of insurance for covered bonds or dissolving them into many smaller private companies or winding down the GSEs' operations and liquidating all their assets.[46]

Calls for an enhanced government regulatory role mainly focus on market deficiencies like mispricing of risk and lack of transparency and accountability. Better regulation of a re-established private-label MBS market on a new disclosure and trading framework is needed, based on data verification and standardization to allow more accurate analysis and with derivatives trading over exchanges of standardized RMBS. Also, the government must have the ability to monitor and maintain limited risk over the cycle, through data standards and verification. Finally, the provision of catastrophic insurance by the government is seen to be critical as a liquidity backstop in times of extreme market distress to preserve stability.[47]

Proposals calling for the establishment of a primarily private market for U.S. mortgage originations and investments and the abolition of the GSEs are driven by the belief that the costs of the agencies' operations outweigh the benefits.[48] Privatization proponents charge that subsidized government programs always "crowd out" private activity distorting investment risk, opportunities and returns. Given the dominant role the GSEs have in the market, there are several transitional steps to get from the current GSE-centric system to a private one. A key step is the reduction of conforming loan limit by $100,000 annually until it reaches zero, and the gradual increase of the fees GSEs charge for guaranteeing RMBS.[49]

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[45] U.S. Department of the Treasury and U.S. Department of Housing and Urban Development. 2011. "Reforming America's Housing Finance Market." Report to Congress, February 2011.

[46] DiVenti, T.R. 2009. "Fannie Mae and Freddie Mac: Past, Present, and Future." Cityscape: A Journal of Policy Development and Research, Volume 11, Number 3, 2009.

[47] Wachter. S.M. 2011. "Mortgages, Standards and the Future of Housing Finance." "*The GSEs, Housing, and the Economy" Conference,* University of Maryland, January 24, 2011.

[48] Jaffee, D. "A Privatized U.S. Mortgage Market." *"The GSEs, Housing, and the Economy" Conference*, University of Maryland, January 24, 2011.

[49] Jaffee, D. and Quigley, J.M. 2011. "The Future of the Government Sponsored Enterprises: The role for Government in the U.S. Mortgage Market." Working Paper 17685. National Bureau of Economic Research.

Those that advocate privatization argue that in the absence of government interventions, RMBS investors would have to face default risk directly. European experience with private mortgage markets, suggests that without government backstops, investors tend to pick safe mortgages.

Also, the use of covered bonds in Europe is seen as another example of potential mortgage choices in a private mortgage market. With covered bonds, European banks are able to hold long-term mortgages on their balance sheets, while passing a substantial part of the interest rate risk to capital market investors. Key to a private market would be lower loan-to-value ratios and recourse, with bank regulators in a position to enforce the required high standards that the market would need.[50]

In a privatized mortgage market, there is still a need for a safety net, which would be provided, according to privatization advocates, by FHA and Ginnie Mae whose activities could be rapidly expanded for conforming loans if needed.[51]

An alternative proposal to the privatization model is a hybrid solution that involves a private-public partnership to reform the current system, given the systemic importance of the GSEs. Proponents of the hybrid approach see a need to balance the enhanced liquidity the guarantees provide to the mortgage market against the challenge of accurately pricing these guarantees and the resulting lack of market discipline against systemic risk buildup.[52]

In the hybrid model, the private sector provides insurance establishing a market price. The key is to have enough private insurance to price the market but not too much to be systemic. In this system, with gradually less government involvement, mortgage rates will reflect market and credit risk. A credible resolution authority would be needed for private insurers while upon failure private MBS guarantees would be pari-passu with unsecured debt. [53]

The hybrid model allows for the market pricing of guarantees with the private sector controlling the quantity of risk created. At the same time, all the risks are borne by the private sector as well, allowing for better alignment of incentives than in the current GSE-driven system.[54] The provision of government catastrophic insurance to ensure the flow of mortgage credit in bad

[50] Jaffee, D. and Quigley, J.M. 2011. "The Future of the Government Sponsored Enterprises: The role for Government in the U.S. Mortgage Market." Working Paper 17685. National Bureau of Economic Research.
[51] Jaffee, D. "A Privatized U.S. Mortgage Market." "The GSEs, Housing, and the Economy" Conference, University of Maryland, January 24, 2011.
[52] Araya, V., Richardson, M., Van Nieuweburgh, S., and White, L. 2011. "How to Reform Mortgage Finance." "The GSEs, Housing, and the Economy" Conference, University of Maryland, January 24, 2011.
[53] Araya, V., Richardson, M., Van Nieuweburgh, S., and White, L. 2011. "How to Reform Mortgage Finance." "The GSEs, Housing, and the Economy" Conference, University of Maryland, January 24, 2011.
[54] Araya, V., Richardson, M., Van Nieuweburgh, S., and White, L. 2011. "How to Reform Mortgage Finance." "The GSEs, Housing, and the Economy" Conference, University of Maryland, January 24, 2011.

times is also present in the hybrid system. Catastrophic insurance would also reduce the odds of risky lending in good times, since only qualifying mortgages would be eligible.

The Future of RMBS

Securitization is still an important feature of the financial markets. New RMBS issuance, at least until the private-label market is once again fully functional, will primarily consist of plain vanilla loans, whose performance is relatively easy to predict. An indication of what subprime RMBS (that do not offer investors disclosure when activities occur with the underlying collateral) will look like going forward is the first post-crisis subprime deal, named Springleaf Mortgage Loan Trust 2011-1, which sold $292 million in AAA-rated securities backed by $497 million of still-performing subprime mortgages loans.[55]

The Springleaf security may be the first of a new wave of subprime deals or RMBS version 2.0. As opposed to similar securitizations before the crisis whose securities were about 90 percent rated AAA, just 59 percent of Springleaf's securities got a AAA credit rating despite the high level of credit enhancement (involving subordination, an interest shortfall reserve fund, and over-collateralization).[56] Investors in the AAA-rated piece of Springleaf will not incur any cash flow losses unless the underlying subprime loans experience more than 51.15 percent in losses.[57] In contrast, before the crisis, a securitization typically needed only a 22 percent level of credit enhancement to be able to get upwards of 90 percent subprime securities rated AAA.

Also, if Springleaf is any indication, in RMBS 2.0 a little credit enhancement will not go a long way. For any given securitization, a much smaller portion of securities is expected to carry top credit ratings and that with having much more credit enhancement than before. RMBS 2.0 will also likely include issuer risk retention. In Springleaf, the issuer held both senior and subordinated tranches.

The fact that the Springleaf securitization required more than double the pre-crisis credit enhancement to achieve AAA ratings for about one-third less of its securities suggests that a the market has learned a key lesson from the financial crisis. Prior to the crisis, there were way too many AAA securities with far too little credit enhancement. This example's 59 percent AAA-rated securities seems to be consistent with estimated loss projections for investment grade tranches in pre-crisis subprime RMBS, which range between 15 percent and 45 percent.[58]

[55] National Mortgage News. 2011. "Springleaf Nonprime MBS Gets AAA Rating from S&P." September 1, 2011.
[56] Standard & Poor's. 2011. "New Issue: Springleaf Mortgage Loan Trust 2011-1." September 19, 2011.
[57] Research and Markets. 2011. " Springleaf Mortgage Loan Trust 2011-1 Sep 11." September 1, 2011.
[58] Shadab, H. 2011. "Springleaf and RMBS 2.0." *Lawbitrage,* September 6, 2011.

RMBS Version 2.0

By Richard Field

Current disclosure practice for residential mortgage-backed securities ranging from covered bonds to securitizations (RMBS) is to report on the performance of the underlying collateral once per month or less frequently. This disclosure practice is the primary reason for the RMBS buyers' strike and the freezing of the non-government guaranteed market.

A better approach to disclosure would be to provide investors with current information through observable event based reporting. Every time an activity occurs involving the underlying mortgage loans that activity is reported before the beginning of the next business day.

This approach is supported by recent events including:

- The well-publicized reaction of JP Morgan's CEO to losses in the bank's portfolio;
- The Consumer Financial Protection Bureau's proposed rules for mortgage loan servicing;
- The EU's establishing the principle that 'knowing what you own' requires the ability to access current information; and
- The Federal Housing Finance Agency's proposal to have a single platform process and track activity on mortgage loans for the benefit of RMBS investors.

The cost of providing investors with observable event based reporting so they can 'know what they own' is small and improves the economic attractiveness of RMBS to the issuer.

'Know what you own' is a significant investor issue.

A primary reason for losses suffered by RMBS investors was it turned out they did not know what they owned.

On August 9, 2007, BNP Paribas issued a news release[59] announcing that it could no longer value sub-prime RMBS. By the time Lehman Brothers collapsed on September 25, 2008, the market for private labeled RMBS had frozen.

Why did the market freeze?

Because investors discovered that while they could see the securities that they owned, they could not look at the current performance of the underlying collateral.

Investors also discovered that current disclosure practices created information asymmetry. Wall Street has the equivalent of tomorrow's news today through its ownership of the

[59] USA Today. 2007. "BNP Paribas freezes security funds." August 9, 2007.

mortgage originators and servicers. Specifically, Wall Street receives current reports on how the mortgage loans backing a specific deal or similar mortgage loans are performing. Investors and other market participants have to wait for once per month or less frequent reports.

Finally, investors discovered a lack of transparency and accountability that prevented them from monitoring servicer performance for compliance with the Pooling & Servicing Agreement. As a result, the buy-side went on strike.

The question is 'what will it take to end the buyers' strike?

While not directly involving RMBS, JP Morgan CEO Jamie Dimon answered what it takes to end the buyer's strike and 'know what your own' when it came to his understanding the credit default swap trades in the bank's portfolio.

As reported by the Wall Street Journal,[60] on April 30, associates who were gathered in a conference room handed Mr. Dimon summaries and analyses of the losses. But there were no details about the trades themselves. "I want to see the positions!" he barked, throwing down the papers, according to attendees. "Now! I want to see everything!" When Mr. Dimon saw the numbers, these people say, he couldn't breathe…

This report

- Shows looking at current exposure details is necessary for 'knowing what you own' and
- Demonstrates that bank information systems have current data as it would be surprising if the attendees went off to get the stale data found in an RMBS report and not the current data requested by Mr. Dimon.

Jamie Dimon both says and demonstrates that the only way to know what you own is to look at current positions. Mr. Dimon's experience with the CDS trades should resonate with RMBS market participants who had a very similar experience at the beginning of the financial crisis.

Unlike Jamie Dimon, investors could not order that current performance information be given to them so they could know what they own, eliminate the information asymmetry and enforce their rights under the PSAs. So instead they went on strike.

The answer to ending the buyers' strike is that, just like Jamie Dimon, investors need to be able to know what they own.

Mr. Dimon showed that the condition that must be present for investors to know what they own for any type of RMBS is access to current information on the underlying collateral performance.

[60] The Wall Street Journal. 2012. "Inside J.P. Morgan's Blunder." May 18, 2012.

Satisfying this condition requires each RMBS deal report at the end of the business day or as promptly thereafter as is possible every observable event that has occurred with the underlying collateral.

What is an observable event?

An "observable event" means, with respect to a mortgage loan that is collateral for any RMBS, any of the following:

- Payment (and the amount thereof) by the obligor on such loan;
- Failure by the obligor to make payment in full on such loan on the due date for such payment;
- Amendment or other modification with respect to such loan;
- The billing and collecting party becomes aware that such obligor has become subject to a bankruptcy or insolvency proceeding;
- A repurchase request is asserted, fulfilled or denied; or
- Servicer charges such as late fees, legal fees, default fees and related costs.

This loan-level disclosure should be implemented in a manner that protects the privacy of individual borrowers consistent with the standards under the Health Insurance Portability and Accountability Act of 1996 (HIPAA).

Why observable event based reporting?

TYI, LLC developed the Brown Paper Bag Challenge[61] in early 2008 and presented it to the industry at ABS East to demonstrate that current RMBS industry disclosure practices do not adequately address the timing of disclosure to investors.

In fact, these practices prevent investors from valuing individual RMBS. This is true even if current disclosure practices are combined with the American Securitization Forum's RMBS disclosure template.

To create a mortgage-backed security, loans are placed into a trust for the benefit of the investors. Among its other duties, the trustee provides reports to the investors on the performance of the underlying loans. Under existing RMBS disclosure practices, these reports are provided on a once-per-month or less frequent basis.

A brown paper bag is the physical model that best represents these mortgage-backed securities. Investors know what loans went into the bag, but under current reporting practices

[61] TYI, LLC 2010. "The Brown Paper Bag Challenge."

they do not know what is in the bag on a current basis. The Brown Paper Bag Challenge highlights why knowing what you own, in this case knowing what is in the bag currently, is important for valuing individual RMBS.

For this challenge, assume that at the start of last month, $100 was placed into a brown paper bag (which is analogous to the loans being placed in a securitization trust). A report has been issued that indicates at the end of last month there was $75 in the bag (which is analogous to the once-per-month disclosure to RMBS investors in an industry standard template).

The Brown Paper Bag Challenge is as follows: what is the value of the contents of the bag today? In the Brown Paper Bag Challenge, everyone is invited to submit an offer to buy the contents of the brown paper bag. If the price offered is accepted by TYI, then money changes hands. If the price offered is greater than the value of the contents of the bag, then the difference is paid to TYI. If the price offered is less than the value of the contents of the bag, then the difference is paid to the individual submitting the purchase offer.

Potential buyers of the contents of the brown paper bag are aware of the following fact: in this challenge, TYI has observable event data so it knows what is in the brown paper bag currently. Wall Street firms that invest in or run servicers handling the daily billing and collecting in RMBS transactions have similar data.

Based on the once-per-month report, existing and potential investors do not know what is in the bag currently even if the bag has a Prime Collateralized Security label indicating it initially contained safe assets. They can only guess at what is a knowable historical fact.

The same is true with respect to RMBS. Once-per-month or less frequent reporting blocks investors from knowing what is currently in RMBS and limits investor valuation of the contents of RMBS to an exercise of blind betting. If investors guess incorrectly, whether buying RMBS or taking the Brown Paper Bag Challenge, they lose money.

To date, TYI has been unable to find anyone who is willing to take the Brown Paper Bag Challenge. However, when a clear plastic bag is substituted for the brown paper bag, everyone is willing to make an offer for the contents of the clear plastic bag. This is because the contents of the clear plastic bag can be seen and valued.

The same could occur for every RMBS transaction. If current information were provided by observable event based reporting, then investors would be able to make informed buy, hold and sell decisions with respect to RMBS. Observable event based reporting has the effect of putting the loans into a clear plastic bag rather than a brown paper bag. This simple example using brown paper and clear plastic bags explains why investors have been reluctant to return to the RMBS markets in the absence of observable event based reporting.

How frequently are observable events reported?

Consider an RMBS that includes only four loans. Each loan is scheduled to make principal and interest payments once per month. They make their payment as follows: Loan 1 in week 1; Loan 2 in week 2; Loan 3 in week 3; and Loan 4 in week 4. As of the end of last month, all the loans were current.

This month, however, is a different story. Loan 1 made its payment in week 2 rather than in week 1. Loan 2 paid only 70 percent of its principal and interest in week 2 and nothing else the remainder of the month. Loan 3 received a modification that reduced its payment by 50 percent. Loan 4 made no payment at all.

There are several ways to report the observable events for these four loans. At one extreme, which reflects current RMBS industry practices, the observable events for the four loans would be reported to investors on a once per month or less frequent basis after the end of the month. This reporting frequency has a fundamental problem. It prevents investors from effectively monitoring and knowing what they own currently.

Almost by definition, the timing of these reports renders them out-of-date when they are made available to investors. The lack of timeliness forces investors to guess historical facts that could be easily known if these facts were not held for release in a once per month or less frequent report.

From an investor's point of view, the existing RMBS reporting system is equivalent to the servicer collecting information in a brown paper bag and then, after the information has aged, delivering the stale information to investors in a once per month or less frequent report.

At the other extreme of possible reporting for the four loan RMBS example, reports would be generated for all loans on a daily basis regardless of whether an observable event has occurred. This reporting frequency has a fundamental problem. Reporting every single loan every day would cause the creation of a significant amount of useless data. If there is no observable event, there is no new information for investors. Daily reporting that includes not only loans with observable events, but also loans without observable events, would create its own form of opacity as investors would have to sort through the data to find the loans that did have an observable event.

Between these two reporting extremes is a better alternative: observable events with respect to the individual underlying mortgage loans should be reported to RMBS investors when the activity occurs. For example, in the case of the simplified four loan RMBS discussed above, if a payment is received on Loan 1 in week 1, then investors would be notified about only Loan 1 on the day the payment is received or as promptly as is practicable thereafter. Similarly, if Loan 1 is modified or the obligor files for bankruptcy, then investors would be notified regarding that

observable event on the date it occurs or as promptly as is practicable thereafter. This reporting frequency has three fundamental advantages.

- It is consistent with how observable events are tracked and reported by the databases that handle the daily billing and collecting of the underlying mortgage loans. For example, consider an observable event-based report that can be accessed today by any person who holds a credit card. The individual credit cardholder can, using existing technology, access a web site of the credit card issuer on any day of the month and review all charges and payments that have been made on the credit card on each day during the month. Similarly, the credit card issuer can, using existing technology, on any day of the month review all the charges and payments that have been made on each day during the month on i) all of its credit cards, ii) a subset of credit cards which are collateral for a securitization or iii) an individual credit card. Credit institutions have considerable expertise in observable event-based reporting. This same expertise and the same information systems could be used to support observable event-based reporting for RMBS.
- Observable event-based reporting would allow investors to monitor performance of the mortgage loans supporting an RMBS as frequently as they would like. Some investors, particularly those investing in the riskiest tranches of a transaction, and independent valuation services will want to monitor the performance of mortgage loans as observable events occur. Denying these investors and valuation services this monitoring ability is counter-productive as it makes it impossible for them to know what they own and value the RMBS.
- Observable event-based reporting would eliminate the informational asymmetry and the related informational advantage of the firms participating in originating, billing and collecting mortgage loans that are collateral for RMBS transactions.

The Consumer Financial Protection Bureau

Under rules it is developing for mortgage servicing, the Consumer Financial Protection Bureau will be requiring that loan-level information on an observable event basis also be made available to consumers. These rules include:

- Up to date and accessible records for each mortgage.

- Transparency in tracking both timely crediting of payments as well as crediting of payments according to PSA terms.[62]

According to a New York Times DealBook article, “all of these rules would give consumers accurate and relevant information so they can understand what their servicer is doing, identify problems as early as possible, and take follow up actions before things start to snowball,” Mr. Cordray, Director of the CFPB, said.[63]

European attempts at transparency

In May 2009, the European Parliament passed Article 122a to the European Capital Requirements Directive. Article 122a requires credit institutions, broadly defined to include commercial and investment banks and their subsidiaries, to ‘know what they own’ or to hold more capital against the position.

According to Paragraph 7 of Article 122a "sponsor and originator credit institution shall ensure that prospective investors have readily available access to all materially relevant data on the credit quality and performance of the individual underlying exposures."

The requirement for readily available access to all materially relevant data is a requirement for observable event based reporting.

The spirit and intent of Article 122a is straightforward: credit institutions should incur a significant capital charge for buying an RMBS that doesn’t offer observable event based reporting.

Confirmation of this interpretation can be seen in the sell-side’s lobbing efforts. In response to the Committee of European Bank Supervisors (CEBS) Public Consultation on the guidelines for Article 122a, the Association for Financial Markets in Europe (AFME), an affiliate of the sell-side’s leading lobbying organization (SIFMA) argued that CEBS was trying to use Article 122a as

[62] Additional rules include

- Proper handling of documentation including obtaining all signatures required for conveyance of the mortgage and note to the trust.
- Servicers would have to take a series of steps designed to optimize recovery to avoid foreclosure. Each step must be documented as they are taken. These steps would assure fair and equitable treatment of borrowers and investors while preserving rights at seniority levels.
- Removing structural disincentives to loss mitigation including conflicts of interest between first and second lien where same servicer is involved with both loans. This includes alignment of servicer compensation and incentives with investors’.

[63] Protess, B. 2012. “Mortgage Servicers Face New Oversight.” *Deal Book,* April 10, 2012.

a “backdoor” for requiring individual loan-level reporting.

Knowing what you own, with or without Article 122a, requires individual loan-level reporting through observable event based reporting. Just ask Jamie Dimon.

However, when it has come to translating this principle into practice, the EU has failed. First, CEBS adopted the monthly reporting frequency of opaque, toxic subprime securities as allowing investors to know what they own. Second, the ECB endorsed a data warehouse to provide reporting quarterly, which is even worse than monthly.

How Should Observable Event Based Reporting be implemented?

The preferred method for implementing observable event based reporting over the life of each RMBS would be through a data warehouse that is free from conflicts of interest. This data warehouse would be the center of a new data-handling infrastructure that would collect, store and distribute observable event based data to all market participants.

The data warehouse would cover all RMBS regardless of whether the RMBS are covered bonds or securitizations, are publicly traded or privately placed, or are backed by a relatively small number or a large number of mortgage loans.

The data warehouse would provide online reports with respect to each RMBS and the underlying mortgage loans including, but not limited to: detailed information on the ongoing cash-flow; the performance of each tranche of the RMBS, including losses that were allocated to each tranche and the remaining balance of mortgage loans supporting each tranche as well as the percentage coverage for each tranche in relation to the RMBS as a whole; the waterfall triggers and their status; the counterparties involved in a transaction and their credit rating; and details of cash injected into the transaction by the originator/sponsor bank or any other support provided to the transaction. Finally, the data warehouse should permit market participants to access each RMBS’ legal documentation.

The data warehouse will be coordinated and operated by two independent parties: a firm with global resources to handle the data on a day-to-day basis and a Coordinator with the subject matter expertise to oversee the data-handling infrastructure.

The role of the Coordinator is critical. It would:

- Bridge the gap between the servicers and the other participants in the RMBS markets.
- Ensure market participants obtain the data that they need.
- Establish the various processes and systems necessary for the servicers to submit standardized loan-level data electronically.

- Direct compliance of the data warehouse so that differences in regulations between nations are properly implemented.
- Reduce both the complexity and the industry's cost of providing loan-level deal specific performance information on an observable event based basis to each market participant's desktop while maintaining the highest possible quality standards for the data.
- Maximize the flexibility of the data warehouse so that it can meet the evolving needs for different types of RMBS into the future.

Investors should be able to trust the data from the data warehouse just as investors trust stock price data from the New York Stock Exchange. This trust requires that only independent third parties who have no actual or perceived conflicts of interest are involved in overseeing, coordinating or managing the data warehouse.

As a result, existing RMBS market participants that have conflicts of interest with RMBS investors should be prohibited from any involvement in the data warehouse including an ownership stake that results in control of the Board of Directors.

Any firm involved in either the day-to-day operation of the data warehouse or the Coordinator role will be required to make on-going full disclosure of its competitive and financial interests in the design of the database, the presentation of the data, the analysis of the data, and the use of the data, including:

- Is the firm engaged in a related business that could gain a competitive advantage from its role? Examples of such related businesses include data distribution, pricing services, trustee services, monitoring, analytic solutions, consulting, ratings services, investment as a principal or agent or portfolio manager, and underwriting.
- Does the firm have investments that could benefit from its involvement in the data warehouse, such as long or short positions in ABS transactions?

Who pays for the data warehouse?

Under US securities law, specifically Regulation FD (fair disclosure), all investors must be able to access the data for free as they must have equal access to information that is disclosed regardless of their capacity to pay. As a result, the cost of providing data through the data warehouse should be built into each new RMBS transaction. Offsetting this cost is the expected reduction in the existing illiquidity premium caused by the lack of a deep, liquid secondary market.

The annual cost of the data warehouse for a new RMBS would be five basis points (0.05 percent) or less of the aggregate amount of the RMBS. The government should pay the cost of linking existing RMBS to the data warehouse. Just like the Superfund program where the government pays for cleaning up toxic waste sites, the government should pay for remedying the opacity and toxicity of existing RMBS by making observable event based reporting available.

U.S. Federal Housing Finance Agency looking to oversee development of data warehouse

In its February 21, 2012 letter,[64] the Federal Housing Finance Agency (FHFA), the agency overseeing Fannie Mae and Freddie Mac, stepped forward to put the principle of 'know what you own' established by Article 122a and confirmed by Mr. Dimon into practice.

It is driving the development of a single mortgage data warehouse to support RMBS deals ranging from covered bonds through securitizations.

The Financial Times wrote an article in which it observed the U.S. may create a public utility to process all mortgage securitizations in the future after the main regulator of housing finance said it wants to invest in a single platform. The plan points to a revolutionary future for the $8,500bn US mortgage-backed securities market, in which all public and private issuers use a single platform to process and track payments from mortgage borrowers through to MBS investors, and Fannie and Freddie may no longer exist….

> "It's about building out an infrastructure for the secondary mortgage market …. "we want to gradually shift some of the mortgage credit risk that Fannie and Freddie are taking on today back to the private market," said Mr. Edward DeMarco [Acting Director of the FHFA].

According to a Bloomberg article, FHFA has realized that a data warehouse is the key to bringing back the private RMBS market. Quoting Mr. DeMarco:

> "If we want to have a secondary mortgage market in the future without Fannie and Freddie we have to start investing."

A liquid secondary market requires that buyers 'know what they own' and therefore the data warehouse must provide observable event based reporting. Without this reporting, buyers will remain on strike.

[64] Federal Housing Finance Agency. 2012. "FHFA Sends Congress Strategic Plan for Fannie Mae and Freddie Mac Conservatorships." News Release, February 21, 2012.

RMBS Market Future

Ending the buyers' strike by providing observable event based reporting through a data warehouse turns the RMBS market into an investor driven market.

Once investors have the information needed to assess each mortgage loan from origination through maturity, they can invest based on their risk/return preferences.

This opens up all sorts of possibilities for constructing RMBS. For example, covered bonds could be valued and rated based on the quality of the mortgage loans backing the bonds and not on the issuing bank's credit rating.

Also, there is the potential for reduced reliance on government mortgage guarantees. With access to all the information they need to assess the risk of each mortgage loan, investors might prefer from a risk/return perspective securities without a government guarantee.

The U.S. Residential Finance Market – The Road to Recovery

By David M. Rowe

We have met the enemy…

Since late 2008, the U.S. has experienced the worst economic crisis since the Great Depression. Furthermore, the nexus of what has become known as the Great Recession was unsustainable residential mortgage lending on excessively lenient terms. It has been said that success has many parents but failure is an orphan. Never was this truer than during the recent economic hardships. Where one points the finger of blame is largely determined by one's political beliefs. Those on the left blame greedy bankers, who they claim, exploited the innocent poor. Those on the right point to the role of government agencies who extended guarantees to packages of poorly underwritten mortgages, thereby allowing private investors to feel they could neglect to perform due diligence.

In truth, there is more than enough blame to go around. Yes, politicians pushed the Government Sponsored Agencies to expand their purchases and guarantees of subprime mortgages in the name of extending home ownership to more working class families. Far from being duped, most marginal borrowers were more than happy to accept a loan they never thought they could obtain to buy a house they never imagined they could own. Prime borrowers took advantage of historically low rates and plentiful availability of credit to buy second homes or to withdraw appreciating value through home equity loans or refinancing into a larger first mortgage. Originators were more than happy to earn fees based on loan volume while banks and investment banks reaped lucrative returns from structuring and underwriting complex packages of these poorly underwritten loans. Credit rating agencies boosted their revenues by applying impressively complex, but in the end fatally shortsighted, analytics to justify unrealistically high ratings for senior tranches of these structured securities. In a period of historically low interest rates, ultimate investors seemed happy to delude themselves into believing that they were receiving excess returns for highly rated securities without correspondingly higher risk. Everyone seemed to be making out well as home prices spiraled upward, fueled by a complacent belief that this situation could be sustained indefinitely. In simple fact, we have met the enemy and they are us.

Unfortunately, arguments over assigning blame can obscure more fundamental problems and lead to faulty prescriptions for how to overcome our current malaise. Rather like a deer in the headlights, we are frozen by our confusion and lack of consensus on workable steps to promote recovery. Sorting out fact from overheated rhetoric is an important first step.

The Role of Collateralized Securities

The central role in the Great Recession played by subprime mortgage obligations has discredited all collateralized securities in the minds of many politicians and much of the general public. This is a serious overreaction. First, such securitization is hardly a new phenomenon. The mortgage market was transformed in 1970 when the U.S. Government National Mortgage Association (popularly known as Ginnie Mae) first guaranteed mortgage pass-through securities. By making broad diversified exposure to carefully underwritten residential mortgage credit easy to acquire and to liquidate, this innovation attracted significant new sources of investable funds into the housing finance market. Pension funds, fixed income mutual funds, insurance companies and individuals now had a means of participating in this market without the prohibitive cost and operational details of acquiring whole loans one at a time. This is one of the great success stories of financial innovation but it was largely forgotten (or willfully ignored) by the popular press amid the upheavals in the subprime Collateralized Debt Obligation (CDO) market in recent years.

The alternative to securitized debt markets is for specialized institutions to operate on an originate-and-hold basis. This tends to create specialized financial institutions, such as traditional savings & loans, which have concentrated exposure to a specific category of debt instrument. Moreover, often such exposure is confined to a narrow geographic region, making the institution vulnerable to localized economic downturns. By limiting the potential for diversification, a financial structure based purely on a buy-and-hold approach to credit provision can be its own source of financial upheaval, as we saw in the S&L crisis of the late 1980s and early 1990s.

Subordination Also Works

Another common statement heard in the midst of the current crisis was, “You can’t make high quality instruments out of low quality collateral.” Despite being a sure applause line, this statement is fundamentally false. Subordination does work. For example, if you had a claim on the first 5 percent of the value in a pool of sub-prime mortgages, this would certainly be a claim that qualified for AAA status. After all, behind these pools were actual physical assets, homes and land. These may have been in less than the most desirable areas and the homes may have been of questionable construction. Nevertheless, there will always be a demand for shelter. Unlike certain types of derivatives where a particular configuration of rates or prices could result in a complete loss of an investor’s capital, it is hard to imagine how securities ultimately backed by claims on real physical assets can become totally worthless. An investor with an enforceable claim on the first 5 percent of the value in such a pool of assets is highly unlikely to suffer a loss.

The essential question, of course, is how much subordination is enough to justify a top credit rating. This is precisely the type of question that simply has no clearly definitive answer.

Different types of analysis will lead to different conclusions. The only certain thing about the situation is that no one can know for sure. This is not necessarily a prohibitive problem. Markets deal with this type of issue all the time. Equity markets are a prime example of this same situation as anyone who watches CNBC can attest. Different analysts will look at the same known facts and reach very different conclusions. Indeed, security prices are the result of balancing competing views. An equilibrium price is low enough that there are sufficient optimists who think they will go higher to be willing to hold the existing stock of the security but high enough to discourage less optimistic investors from seeking to buy. *The crucial requirement for this type of market to work effectively is that a large number of analysts have access to broad and deep sources of information on which to base their views. This is the central feature that is missing in the market for complex instruments collateralized by a large number of small idiosyncratic obligations.*

Complexity, Technology and Vested Interests

To a degree, the subprime mortgage crisis was the culmination of a decades long process of technology transforming the structure of financial products and the fabric of financial markets. The overriding feature of this transformation has been a massive growth in complexity. A strong case can be made that the advent of personal computers and spreadsheets in the early 1980s was instrumental in creation of the interest rate swaps market. The PC and spreadsheets empowered business practitioners to develop their own software functionality with previously unmatched speed and flexibility. No longer was it necessary to operate through preparation of detailed specifications and a painfully slow waterfall implementation process to develop a new financial product. The high priesthood of computer systems people were elbowed to the sideline by the democratization of access to both software development tools and localized computing resources. In the words of a common complaint among professional data processing staff at the time, “The users are revolting – in both senses of the term.”

Of course, one result of this helter-skelter development process was a deterioration in testing and quality assurance. This gave rise to recurring problems with inadvertent software bugs and, less frequently, overt manipulation of valuation procedures. Model risk became a new term in oversight and control circles. While some of these problems continue to occur even today, rigorous enforcement of regulatory and internal model review standards generally serves to keep such problems to a minimum.

Two other characteristics of technology-driven growth in complexity have been harder to address. These are:

- The cultural divide between “quants” and general business managers that I refer to as the Danger of Two Cultures.

- The daunting obstacle that two sources of complexity create for effective risk assessment.

Behavioral Obstacles and the Danger of Two Cultures

The development of a highly quantitative subculture in finance has led to a situation similar to the one C.P. Snow described in a 1959 essay entitled *The Two Cultures and the Scientific Revolution*[65]. In it Snow highlighted the often willful lack of communication between scientists and literary intellectuals[66]. In all too many cases, Snow argued, formal training compounded inherently different mindsets to produce a nearly complete lack of understanding and communication across these two cultures. Scientists, he found, often had little interest in or exposure to imaginative literature. On the other side, literary intellectuals often treated their realm as the whole of culture, blithely oblivious to the scientific edifice of the physical world as "in its intellectual depth, complexity and articulation, the most beautiful and wonderful collective work of the mind of man."

The split between "quants" and the larger community of traditional finance managers gives rise to a similar lack of communication. Quantitative techniques and statistical risk management are little more than opaque black boxes for all too many general financial executives. What is more, those who do understand the technical details often have limited insight into broader structural and behavioral issues. They also have little incentive to make their work more transparent to outsiders since this would undermine the "mystique" that surrounds their skill set.

In some cases a lack of technical insight has little or no serious consequences. After all, few of us can understand the technical mechanics of a modern automobile but that does not inhibit our ability to drive. In the case of financial management, however, the impact of Two Cultures can be serious indeed. This is primarily because running a financial institution demands a constant series of large and small decisions under uncertainty. Such decisions can never be effective if they are made mechanically. Effective decisions must reflect experience and judgment *conditioned by the available empirical evidence*. As finance has become ever more complex and quantitative, the communications gap between its Two Cultures has become ever more consequential. Most senior bank managers are unable to weigh the subtle details of modern quantitative finance and few state-of-the-art quants are well equipped to assist them (even if they were motivated to do so.)

I have no magic answer to the Two Cultures problem. The number of people with the background to feel genuinely comfortable in both cultures will continue to be limited. Recognizing their contribution as a bridge to facilitate communication across the organization

[65] Snow, C.P., *The Two Cultures and the Scientific Revolution*, Cambridge University Press, 1959.
[66] Snow was a trained scientist who also wrote imaginative literature. As such, he was uniquely qualified to assess the problem of The Two Cultures.

and raise the level of insight on both sides of the cultural divide is a step in the right direction. Offering opportunities where representatives from both cultures can interact on substantive issues, such as senior policy committees, also will help. Beyond this, just raising awareness of the potential dangers from miscommunication and lack of insight across the groups can be helpful when important decisions depend on considerations from both perspectives.

Complexity and the Challenge of Risk Assessment

The growing complexity of financial products has advanced on two fronts. The first source of complexity is the wide variety of customized conditionality used to determine ultimate cash flows to investors. In general these conditions give rise to complex computational requirements for deriving accurate prices in the face of prevailing market conditions. Indeed, it is the growing availability of computing power that has enabled the development of these increasingly complex payment structures.

Unfortunately the computing challenge these products present for risk management is even more daunting. This is because analysis of risk demands consideration of many different future scenarios. While the conditional pricing analysis for each scenario can potentially be simplified relative to front office algorithms, the multiplicity of scenarios implies a much heavier computational requirement than is required for daily pricing and operational processing. This is a generic challenge facing all types of financial derivatives and can only be addressed by management being willing to allocate sufficient computing resources to support effective risk management simulations.

The second source of complexity presents a far more daunting problem. This is the challenge presented by collateralized securities being created based on an ever wider range of heterogeneous underlying obligations. What began as a way to package large commercial obligations or home mortgages subject to strict and inflexible underwriting standards has expanded to include auto loans, revolving credit card debt, trade receivables and even such things as future movie royalties. The infrastructure to provide ready access to all relevant risk related data on the underlying obligations has lagged far behind.

It can be argued that until recently the cost and availability of computer information storage, processing power and communication capacity presented significant obstacles to addressing this problem. Today those obstacles have largely disappeared. A system where the underlying details of every individual obligation in a mortgage-backed security (such as up-to-date information concerning payment status, geographically related comparables, original and current loan-to-value ratios and much more) along with the cash flow structure of the security and the implications of pre-existing defaults or repayments, could be maintained in a coherent database available to market participants. The main obstacle to this is institutional resistance to divulging information that is deemed to convey competitive advantage. Technology can create

and maintain greater transparency in these markets if the buy-side, regulators and the general public can muster the collective will to demand it.

In large measure the failure of markets to address these two problems is not surprising. The burgeoning complexity of payout structures combined with the absence of adequate data and the associated analytical tools to evaluate their implications have fostered ever greater opacity in credit markets. This generally works to the advantage of large sell-side firms. In a crisis, these firms themselves can fall victim to this opacity (consider Bear Sterns, Lehman Brothers, RBS and others.) Nevertheless, on a day-in and day-out basis, opacity clearly supports wider bid-offer spreads that serve to enrich those who make markets in these instruments. It is hardly surprising that sell-side firms oppose reforms to bring greater transparency to these markets with all the political pressure that their financial clout can command. What is surprising is how passive buy-side firms have been in accepting this situation as an unavoidable state of nature.

Market-driven Transparency

How could a detailed, up-to-date and readily accessible database with all relevant structural details of the underlying collateral become a standard feature of the markets for complex financial products? As Adam Smith would have said, we will not accomplish this by appealing to "the benevolence of the butcher, the brewer" or the investment banker. The dramatic improvement in transparency that technology now makes possible will only be fully realized and effectively maintained through a combination of regulatory coercion and appeals to self-interest.

In additional to regulatory pressure, establishing such a system will require several things. The first is a well-heeled insurgent organization with little or no stake in the current market arrangements to underwrite the technical development of such a system. Second it will require participation commitments from a core group of buy-side firms who would stand to benefit from the greater transparency, lower risk and sharper pricing that such a system would create. Finally, it will require commitment from some aspiring second-tier sell-side firms who would stand to benefit from a first mover advantage by being an early participant in such a transformative arrangement and the big increases in trading volume it would create. A major technology firm also must be involved. This could be in the form of a purely arm's length vendor who is paid for the system's development or as an equity partner or some combination of the two.

Essential to the success of such an arrangement will be assuring prompt and accurate updates to the information and establishing sufficient trading volume and associated liquidity to insure investors that they can transact in reasonable volume without significant impact on prevailing prices. Marketcore[67], an intellectual property company, is a key innovator in this area and has

[67] See http://www.marketcore.com/index.php

developed foundational technology for creating healthy and transparent markets. One of Marketcore's patented solutions[68] is centered on the provision of time-limited Transaction Credits™ to liquidity providers as well as those responsible for maintaining the continuous updating of the underlying data. These credits provide either discounts on future trades or privileged access to the uniquely valuable detailed data such a system makes available. Their terms of use also can be adjusted to drive business volume toward newly introduced products or areas where the exchange desires to promote market interest and liquidity. They also could be traded for cash as desired. In addition to liquidity providers, transaction credits can be allocated to originators and servicers as incentives for prompt and accurate updates to the detailed status information in the database.

In essence, Marketcore's patented technology leverages the most valuable commodity such a system creates, namely the consistently organized detailed data on the complex securities being traded, to solve the key challenges that such a new trading system faces, namely building reliable liquidity and assuring that the data are maintained in a timely and accurate fashion. Once established, the usage pattern of Marketcore's Transaction Credits™ becomes a valuable source of market intelligence. Such usage data can offer valuable insights into evolving market interest and areas where increased analytical attention may indicate emerging market concern about potential risk.

Of all the financial markets operating today, the housing finance market is among those most in need of Marketcore's innovation and also the most likely place for it to succeed. Many of the same financial institutions that would instinctively oppose this innovation (because it undermines the advantages they gain as market-makers from the prevailing level of opacity) also have a need to unburden themselves of existing mortgage assets. Revival of the residential mortgage CDO market would offer them a means to draw new sources of capital into this arena on a fully transparent and well informed basis. There is simply no way these investors will return to this market until such transparency is clearly available. As the old saying goes, "Fool me once, shame on you. Fool me twice, shame on me." Furthermore, if established on a firm foundation of currently updated information and stable incentives, a revived residential finance market would provide long-term investors with a valuable alternative that currently is simply not viable.

The stars are well aligned to support such a development. One indication of this is that the first such transformation is actually in initial operation. LexisNexis has collaborated with the Council of Insurance Agents and Brokers (CIAB) and Marketcore to create the LexisNexis Insurance Exchange[69]. It is initially focused on property and casualty policies but it has plans to expand

[68] Marketcore's issued patents include US Patent Nos. 6594635, 7742966 and 8027909.
[69] See, http://www.businessinsurance.com/article/20120101/NEWS04/301019988
http://blogs.lexisnexis.com/insuranceexchange/2012/02/10/getting-left-behind-is-closer-than-you-think/

into life and health as well as reinsurance. Since a similar mechanism would be equally applicable to various heterogeneous credit and derivative instruments, this might just be the beginning of a much broader market transformation.

If this transformation materializes, it will result in more robust and resilient credit markets. Such a structure would allow a wide variety of analysts to track and evaluate these securities based on reliable empirical data rather than on marketing hype or on complex top-down analytic techniques that are out of touch with the actual underlying collateral. In the end, such a structure would provide many opportunities even for those sell-side firms that will resist it the most. A more transparent market, built on access to reliable and up-to-date detailed data, will generate demand for new and innovative hedging instruments that these firms are so well equipped to provide. Given the broad social benefits that flow from more efficient allocation of savings into real investments with the best return, we all should work to realize this vision.

The Evolution of the RMBS Market

By Edward Toy

What is the next step in the evolution of the markets for residential mortgage-backed securities? How is the broader asset-backed securities market evolving?

Any discussion of the first question must be firmly grounded in a more fundamental issue that is a matter of public policy in the United States. That is, to what degree is universal home ownership seen as an economic imperative. The regulatory policies of the last several decades were in large part driven by the political decision to encourage and foster universal home ownership. That allowed for both explicit and implicit expansion of the mandate at Fannie Mae and Freddie Mac. It also engendered an atmosphere that not only allowed for but in fact incentivized growth in lending to borrowers with weaker credit histories. Before the unbridled growth of the late 1990's through 2007 in both the agency and non-agency market, the balance sheets of Fannie Mae and Freddie Mac grew modestly from year to year and any loosening in underwriting standards for non-agency RMBS was met with high levels of skepticism by either the Nationally Recognized Statistical Rating Organizations (NRSROs) or sophisticated institutional investors, or both.

The Wall Street Reform and Consumer Protection Act of 2010, otherwise known as the Dodd-Frank Act (DFA), include at least two provisions that have significant bearing on the RMBS market. First, DFA mandates that federal regulators remove any reference to NRSROs in their guidance. Importantly, it does not just preclude exclusive reliance, but any reliance at all. That by its nature means that regulated entities, in order to comply with new regulatory guidance will also not be able to refer to NRSROs in their risk management practices. This is subject to reconciliation with Basel II/III doctrines which in fact bases capital requirements in their standard approach on NRSRO ratings. The thinking was that not just over-reliance but reliance in general on flawed NRSRO ratings was a principal cause of the financial bubble that ultimately burst. Forcing both federal regulators and investors in general to do their own due diligence will eliminate this risk. A second component of DFA imposes new requirements referred to as risk retention rules on any securitization, including RMBS. Many believe that asset originators were effectively incentivized to not care about the underlying risks of the assets that were sold into securitization vehicles. Their focus was solely on generating fees and other forms of profits from the origination process. Under circumstances that do not meet guidelines for qualified financial assets which are deemed to be low risk, the originators will be required to retain an interest, and therefore a risk of loss. This is expected to remove the moral hazard issue. There are, however, still many details to be finalized in how exactly the risk retention rules will be implemented. The risk retention guidance does not stipulate if it should be a vertical slice

across all risk profiles or a horizontal slice equivalent to a first loss position. Since assets intended for securitization and the resulting structured securities are also marked at origination at prices other than face value, what the retained position should reflect is also relevant but left unaddressed.

As a major second part of the overall reform effort, the current administration and Congress have endorsed the goal of unwinding Fannie Mae and Freddie Mac. Both Fannie Mae and Freddie Mac were taken into conservatorship by the government and injections of billions of dollars have already been required to offset the losses incurred by those two entities and to sustain their ongoing obligations. Otherwise, the systemic repercussions of their failure across the entire market and the economy would have been devastating, or so it was feared. Because of this, many view the involvement of the Federal government in housing finance as having gone too deep and too wide. The Federal Housing Finance Agency (FHFA) has given comfort to the market by asserting that the Federal government will continue to provide sufficient capital such that Fannie Mae and Freddie Mac will continue to meet their existing obligations. Therefore, the one scenario at the farthest extreme would mean Fannie Mae and Freddie Mac would cease underwriting any new transactions and let their existing portfolios run off.

Implementing that scenario in the near term would have a profoundly negative impact on the markets. In the current state of uncertainty in the markets with respect to home prices, the strength of underwriting and near term prospects for the economy, the non-agency mortgage securitization market is virtually non-existent. Fannie Mae and Freddie Mac have been underwriting more than 90 percent of the securitizations that have occurred in the last two years. To the extent residential mortgages have been originated that do not meet agency standards, banks have largely retained them in portfolio. Bank liquidity and capital, however, continue to be strained, and the prospects for that improving in the near term are not high with the more stringent capital requirements under Basel III scheduled to become effective in 2013. Even if that were not the case, growth in the securitization market, and hence growth in Fannie Mae and Freddie Mac, was in many ways driven by the need for banks to do a better job of asset-liability management. The disintermediation problems of the 1970s and 1980s were caused by bank deposits, which are largely short term liabilities, being improperly matched against the long term assets of long term loans to corporations and the standard 30-year residential mortgage.

The securitization market solved this dilemma by carving that mortgage into sequential tranches that let the bank retain the short end cash flows while selling off the long end cash flows to investors whose liability structure was better suited to that risk, including insurance companies. Private capital, for short term cash flows from banks and for long term cash flows

from institutional investors will return eventually. However, it is easy to see that the recovery time will be an extended one without some kind of support from the Federal government since the market would then be looking to private capital to not just recover what it had in the non-agency market before the financial crisis but also the agency volume of Fannie Mae and Freddie Mac.

Realizing this, even the strongest advocates of housing reform have generally backed away from a zero role for the Federal government in housing finance to engender a much reduced role. The exact shape of that reduced role is the subject of many discussions, primarily focused on different mechanisms for government guarantees of only a portion of the defaults and losses given default of eligible residential mortgages. This may be solely as a reborn agency with a different mandate, or in partnership with private mortgage insurers with shared responsibilities for due diligence. The continued involvement of the Federal government is critical if there is to be any expectation of near or even medium term recovery in housing finance. That brings us back to the basic question of public policy and whether universal home ownership or any level approaching historical experience is considered a mandate. Assuming that to be the case, for both political and economic reasons, then serious Federal involvement in housing finance is a necessity and it is only a question of what form. This will not only bear on future growth in home ownership, but also on recovery in home prices which have declined more than 30 percent nationally since their peak in 2007. Until improvements in home prices are realized there will be ongoing pressure from the foreclosure overhang of mortgages currently in default and the prospect of another spike in delinquencies. This would likely be driven by the fact that many homeowners face the reality of current home values being less than outstanding mortgage balances, estimated to be more than 25 percent of the current stock.

Whatever the form of Federal involvement in housing finance, it is safe to say everyone today would argue for a higher level of diligence and a lower level of risk in residential lending. It does not take a very long historical perspective to find a time when defaults even in weak economic climes did not reach into the double digits. In the 1990s, as the non-agency RMBS market grew, there was an intense attention paid to underwriting standards for residential mortgages that focused on key criteria both on individual loans and on the overall characteristics of the pools. The goal was not necessarily to minimize the risk of default, though that would be an ideal, but more importantly to recognize the risk being taken, and to properly adjust for that from a risk return perspective. Financial bubbles exist when investors develop the belief that there is no risk. Pricing follows and available capital explodes. When required returns are reasonably risk adjusted, capital is properly allocated. While there will continue to be ebbs and flows as are

natural for a desirable market, financial bubbles do not become extreme and volatility is lessened.

Harkening back to those days was a paper entitled *A Credit Intensive Approach to Analyzing Whole Loan CMOs* I wrote when I was a portfolio manager for TIAA-CREF, a major investor in non-agency RMBS and one of the largest holders of subordinate RMBS classes at the time. That paper focused on loan-to-value, minimum documentation requirements and the differing risk profiles of different loan sizes and purposes, and occupancy types, among other factors. It also looked at the importance of diversification and general underwriting diligence. It is relatively easy to point fingers at the NRSROs and the high ratings they assigned to RMBS securities that were backed by subprime mortgages as a primary reason for the financial bubble, and therefore the resulting crash. A more sobering reality, however, is that the NRSROs simply got caught into the same trap as almost everyone else that was involved in the residential mortgage market. Underwriters, investors, regulators, and borrowers, almost everyone became excessively comfortable with the notion that home prices would continue upward in an almost unbreakable pattern. Any other credit issues would be easily outweighed by the ability to sell a home for significantly more than what it was originally bought for. Modeling defaults and losses based on only a few years of relatively thin data became the accepted norm. As long as multiple scenarios were included, it did not matter that all of the paths assumed the same volatilities. This overreliance on models served to exacerbate the moral hazard issues since the models clearly showed that risk was minimal and largely uncorrelated. The flaws in the analysis by virtually everyone involved led to the financial meltdown, the overhang that still weighs on the market and is likely to be with us for years to come.

In the residential financing arena, the 30-year mortgage is largely a U.S. phenomenon, especially the fixed rate version. Limiting availability of the 30-year option would create an overhang on home prices. All other factors remaining the same, simply reducing the 30 year term to a 15 year term reduces financing availability, and hence housing affordability, by more than 30 percent. This returns again to the same or similar question. Even downsized from universality, is affordable home ownership a public policy mandate. Given the political and economic consequences of essentially saying the entire home market is worth 30 percent less today, the answer is an unavoidable one. There are no other options but to say that resurrecting a viable 30-year financing market is an imperative. If the 30-year financing market is an imperative, then so is the securitization market, since without it disintermediation problems become chronic and lead the different financial sectors into potentially serious asset-liability mismatches.

Overall exposure to RMBS in the U.S. insurance industry has been flat to modestly declining since the height of the financial crisis in early 2009. Exposure to non-agency RMBS has declined substantially from $200 billion to $130 billion at the end of 2010. The declines were the result of impairments, sales, and repayments, coupled with the lack of any new issuance. On the other hand, the US insurance industry, especially the Life side, has been a longstanding participant in the residential mortgage-backed market, both in agency and non-agency paper. The long end cash flows fit the longer tailed liabilities of the industry. Stable and relatively predictable liabilities also give the industry flexibility in managing the cash flow variability of RMBS. A regulatory framework, as currently engendered by risk-focused examinations, that generally rewards a strong analytical approach to investment guidelines, serves to discourage sole reliance on NRSRO ratings. The current NAIC framework for assigning NAIC Designations that are mapped to RBC factors for RMBS further distances the US insurance industry's reliance on NRSROs for this asset class. A more appropriate risk-return profile will foster a strong return of US insurance industry to this asset class as new issue volume recovers.

Residential mortgage-backed securities, while certainly the most significant in size and breadth, are only one part of the larger structured securities market. The decade leading up to the financial meltdown saw dramatic growth in commercial mortgage-backed securities (CMBS). RMBS and CMBS are the two most significant portions of US insurer holdings, representing roughly two-thirds of non-agency related structured securities. The remaining holdings stretch across a wide swath of different asset classes and structures; from the relatively benign and simple credit card receivables deals to the considerably more complex insurance linked securities. For the most part, the performance of most of the different asset types was reasonably good throughout the financial crisis. A few notable exceptions were home equity loans and collateralized debt obligations (CDOs). While home equity loans function with a different dynamic than other residential mortgages, there is a reasonably strong correlation from a probability of default perspective. Losses given default tend to be more severe, since these are second liens. CDOs are also a different animal, beginning with a higher sensitivity to the asset manager. Unlike other asset-backed securities, CDOs are generally not static pools, but include at least some degree of active management of the pool of assets. The underlying assets in CDOs in many cases were RMBS, and oftentimes the mezzanine and subordinate classes from structures that were more difficult to sell individually.

As already noted, in the years preceding the financial crisis, the CMBS market grew dramatically. This included investments in the asset class at US insurance companies at the same time that investments in direct loans on commercial properties declined. While the downturn in CMBS was not as severe as it was in RMBS, problems did exist, defaults did rise to previously unseen levels and losses on subordinate classes were realized. It is generally

recognized that valuations of commercial properties did reach inflated levels as they relied on overly aggressive expectations for growth in cash flows and unjustifiably low discount rates. Loan-to-value ratios migrated upwards, further straining debt service coverage ratios. Many believe that these looser underwriting standards have since been reverse in what investors refer to as “CMBS 2.0”. What is still of concern over the near term are maturing loans originated during the boom years that will require refinancing in 2012 through 2014. It is likely that many of these loans are not re-financeable without a substantial injection of equity.

The basic premise behind the asset-backed or structured securities market, defined broadly to include RMBS and CMBS, is a simple one. Any asset, financial or otherwise, that can generate cash flow on a reasonably predictable basis can be packaged in a structure on a standalone basis, separating the risk of those particular cash flows from other potentially intervening risks, such as financial difficulties of the bank or entity that originated the assets. Yields and spreads on asset-backed securities are usually more attractive than on comparable quality corporate issues. However, since the risk of non-payment from the assets is separate from that of the originator, it has been generally the case that this is a more cost efficient way to fund a business line, by doing it off-balance sheet. While there have been exceptions, up through the financial crisis, the credit experience has also been a very positive one. Carving out the asset types already mentioned here, the credit story is still a good one. However, with such significant problems in these few asset types, on top of the celebrated issues in RMBS and CMBS, confidence in structured securities, including the asset-backed market, was severely shaken. The complexity of many structures, specifically designed to protect the investor, created an even more negative impression, especially for those that did not understand the basic premise. New issue volume almost completely dried up in 2009 and only slowly has been reviving. One example has been the insurance linked securities market. While a relatively small part of the structured securities market, this has been a valuable avenue for increasing reinsurance capacity, for both primary insurers and reinsurers.

There is a different kind of security that some consider to possible alternative to at least some asset-backed securities. Covered bonds are widely used outside of the United States, especially in European markets. Covered bonds are issued by a variety of different kinds of corporations and remain direct obligations of those entities. Financial institutions are frequent issuers. They are secured by assets, and when issued by financial institutions are often secured by the same kinds of assets typically used in structured securities here in the United States, such as residential mortgages. The assets also remain on the balance sheet of issuing entity such that defaults and losses on those assets are the responsibility of the issuing entity. In these ways, covered bonds are not dissimilar from simple secured notes. Where they differ is that the issuing entity also has the flexibility to manage the portfolio of assets in the pool and change

them within certain specified guidelines. Also, in the event of an insolvency, the investors in the covered bonds have the immediate right to take the assets and are not subject to any automatic stay rules that are required under bankruptcy laws. Providing for this latter provision requires legislation in the United States that is currently under consideration. If the legislation does eventually pass, it is uncertain how large a market this would be given that both the obligations and the assets remain the responsibility of the issuing entity. The attractiveness of the asset-backed market is the separation of risk, between the specifically isolated assets and the sponsoring entity. This is not only an attractive feature to many investors; companies also benefit from a smaller balance sheet and lower leverage ratios.

However, the effort to pass covered bond legislation does point to a recognition that revitalizing a financing market for standalone assets is important. Having a robust asset-backed market provides significant liquidity for the owners of those assets. That liquidity represents an efficiency in the capital markets, directing funds according to the desired risk-return profile specific to the type and quality of assets. Some improvements in regulatory oversight are clearly needed. As noted earlier, the risk retention rules under DFA require some additional clarification. Improvements in transparency and disclosure about the nature and risks of the assets are also important. In addition, stronger representations and warranties by those entities originating the assets need to be enforced.

The U.S. insurance industry has for many years now been an active participant in the asset-backed securities market. Though only a small percentage of invested assets, investments in some of the more esoteric asset-backed securities are a significant component of diversification within portfolios. This is in addition to larger exposures to RMBS and CMBS. As of year-end 2010, asset-backed securities represented just a little more than 4 percent of the U.S. insurance industry's bond portfolio, this was slightly more than the non-agency RMBS portfolio and slightly less than the non-agency CMBS portfolio. Structured securities, including agency-backed paper, represented about 23 percent of the bond portfolio and about 16 percent of total invested assets. Structured securities also fit well with the analytical focus and largely still buy and hold approach of insurers. There is no reason to believe that asset-backed securities will not continue to be an important part of the US insurance industry's investment strategy going forward.

The Future of Securitization[70]

By Steven L. Schwarcz

Securitization's Role in the Financial Crisis

The securitization of subprime mortgage loans is widely viewed as a root cause of the financial crisis. In the United States, there was significant government pressure on banks and other lenders to make home-mortgage loans to expand home ownership, even for risky borrowers. These subprime loans were often made, for example, to borrowers with little de facto income, anticipating that home-value appreciation would enable the borrowers to refinance to lower-rate mortgages. Historically, home prices had generally been increasing in the United States since the Great Depression.

But this model failed when, in 2007 and 2008, home prices fell significantly. In one sense, the precipitous drop in home prices was unexpected—like Monty's Python's skit, "Nobody expects the Spanish Inquisition." In another sense, though, the fall arguably should have been anticipated based on the earlier liquidity glut and its artificially low interest rates, driving up housing prices artificially.

As a result of the fall in home prices, borrowers who were relying on refinancing for loan repayment could not refinance. Furthermore, many subprime mortgage loans had adjustable rates which increased after an initial "teaser" period. Borrowers who could not afford the rate increases had expected to refinance at lower interest rates. That likewise was stymied by collapsing home prices. For these reasons, many risky borrowers began defaulting.

These defaults in turn caused substantial amounts of low investment-grade-rated mortgage-backed securities to default and the highest (AAA) rated securities to be downgraded. That, in turn, spooked investors who believed that AAA meant iron-clad safety and that "investment

[70] This section of the paper is based on a Leverhulme lecture at the University of Oxford, Faculty of Law and in part on the following works: *The Future of Securitization*, 41 CONN. L. REV. 1313 (2009), available at http://ssrn.com/abstract_id=1300928; *Understanding the Subprime Financial Crisis*, 60 S. C. L. REV. 549 (2009), available at http://ssrn.com/abstract_id=1288687; *Conflicts and Financial Collapse: The Problem of Secondary-Management Agency Costs*, 26 YALE J. ON REG. 457 (2009), available at http://ssrn.com/abstract_id=1322536; *Fiduciaries With Conflicting Obligations*," 94 MINN. L. REV. 1867 (2010), available at http://ssrn.com/abstract=1441225; *Bond Defaults and the Dilemma of the Indenture Trustee*, 59 ALA. L. REV. 1037 (2008; with Gregory M. Sergi), available at available at http://ssrn.com/abstract_id=1072842; *The Limits of Lawyering: Legal Opinions in Structured Finance*, 84 TEXAS L. REV. 1 (2005), available at http://ssrn.com/abstract=774350; *Securitization Post-Enron*, 25 CARDOZO L. REV. 1539 (2004), available at http://ssrn.com/abstract=386601; *Disintermediating Avarice: A Legal Framework for Commercially Sustainable Microfinance*, 2011 U. ILLINOIS L. REV., issue 4, available at http://ssrn.com/abstract=1612766; and *The Conundrum of Covered Bonds*, THE BUSINESS LAWYER (May 2011), available at http://ssrn.com/abstract=1661018.

grade" meant relative freedom from default. Investors started losing confidence in ratings and avoiding all types of rated debt securities.

Fewer investors meant that the price of debt securities began falling. Falling prices meant that firms using debt securities as collateral had to mark them to market and put up cash, requiring the sale of more securities, which caused market prices to plummet further downward in a death spiral. The refusal in mid-September 2008 of the U.S. government to save Lehman Brothers, and its resulting bankruptcy, added to this cascade. Investors lost all confidence in debt markets, and even the short-term commercial paper market virtually shut down.

The lack of debt financing meant that companies could no longer grow and, in some cases, even survive. That affected the real economy and led to the financial crisis.

Addressing Securitization's Problems

Because of its role in initially triggering the financial crisis, securitization has been vilified. But prior to the crisis, and even now, securitization is one of the primary mechanisms by which companies can obtain financing from the capital markets, bypassing high-cost intermediaries such as banks—an approach known as "disintermediation."

As a tool for disintermediation, securitization can more precisely allocate risk with capital, avoiding middleman inefficiencies. It also can enable companies to access capital markets directly, in most cases at lower cost than the cost of issuing direct debt (such as bonds or commercial paper). Moreover, when the securitized assets are loans (such as mortgage loans), securitization can help to transform the loans into cash from which banks and other lenders can make new loans. (Indeed, the function of the quasigovernmental firms, Fannie Mae and Freddie Mac in the U.S. has been to ensure this transformation process occurs.)

These positives might be outweighed, however, by securitization's flaws revealed by the recent financial crisis. Whether securitization, even with the flaws, created net positive value is an unresolved question. My goal is not to attempt to answer that question. I merely examine how to overcome these flaws.

There are at least four potential flaws: subprime mortgages may be a problematic asset type that should not have been securitized; the originate-to-distribute model of securitization might create moral hazard; securitization can create servicing conflicts; and securitization can foster overreliance on mathematical models.

The financial crisis also revealed a possible fifth flaw: that investors in securitization transactions may over-rely on rating-agency ratings. The extent of appropriate reliance on ratings, and indeed the integrity of the ratings process itself, are questions beyond the scope of this section of the paper.

In this section of the paper, the following terminology is used:

Subprime mortgage loans (also called subprime mortgages) are loans made to risky borrowers who use the proceeds to purchase homes and then mortgage the homes as collateral; because the borrowers are risky, the collateral is the primary source of repayment.

In the most basic form of mortgage securitization, mortgage-backed securities (MBS) are issued by a special-purpose vehicle (SPV), and payment on the securities is derived directly from collections on mortgage loans owned by the SPV.

More complex forms of mortgage-backed securities include collateralized debt obligation (CDO) securities in which payment derives directly from a mixed pool of mortgage loans and sometimes, also, other financial assets owned by the SPV; and ABS CDO securities in which payment derives from MBS and CDO securities owned by the SPV (and thus indirectly from the mortgage loans and other financial assets underlying those owned securities).

Subprime mortgage securitization can reference any of these financial products, as long as all or a material portion of the underlying financial assets consist of subprime mortgages.

What Went Wrong, and What Needs to Be Fixed?

A. Problematic Asset Type.

The failure of subprime mortgage securitization was caused by its almost absolute dependence on home appreciation. Some believe this type of particular sensitivity to declines in house prices was unique. From that perspective, parties structuring securitization transactions can minimize future problems by excluding, or at least limiting and better managing, subprime mortgage loans as an eligible type of underlying financial asset, and also by conservatively assessing the payment prognosis for other types of financial assets underlying securitizations. This is important not only to protect the integrity of securitization transactions but also to avoid the unintended consequence that securitization of a problematic asset type can motivate greater origination of that asset type.

This is not to say these procedures will be failsafe. Parties to (and investors in) securitization transactions must always be diligent to recognize and try to protect against the possibility that the underlying financial assets might, as in the case of subprime mortgage loans, fail in unexpected ways.

What would happen to automobile loan securitization, for example, if a technological innovation makes cars obsolete, depriving even financially healthy borrowers of the incentive to repay their loans? The invention of a new form of personal transportation is at least as plausible as the idea that home prices—which generally had only risen since the 1930s—would

suddenly collapse in value at a rate higher than that seen during the Great Depression (as happened in the recent financial crisis).

The financial crisis also teaches us the danger of mixing politics and finance. Before that crisis, there was political pressure to securitize risky subprime mortgage loans to facilitate financing for the poor. We are likely to see the same type of political pressure to securitize risky microfinance loans to facilitate financing for the poor and disadvantaged, which I later discuss.

B. Originate-to-Distribute Moral Hazard.

Some argue that securitization facilitated an undisciplined mortgage lending industry. By enabling mortgage lenders to sell off loans as they were made (a concept called "originate-to-distribute"), securitization is said to have created moral hazard since these lenders did not have to live with the credit consequences of their loans. Mortgage underwriting standards therefore fell, exacerbated by the fact that mortgage lenders could make money on the volume of loans originated.

I find the moral hazard argument weak. Mortgage underwriting standards may have fallen, but there are other explanations of why. For example, lower standards may well reflect distortions caused by the liquidity glut of that time, in which lenders competed aggressively for business, allowed otherwise defaulting home borrowers to refinance, and (in the corporate lending context) even made so-called 'covenant-lite' loans. The fall in standards may also reflect conflicts of interest between lending-firms and their employees in charge of setting those standards, such as where employees were paid for booking loans regardless of the loans' long-term performance.

Blaming the originate-to-distribute model for lower mortgage underwriting standards also does not explain why standards were not similarly lowered for originating non-mortgage financial assets used in other types of securitization transactions. Nor does it explain why the ultimate beneficial owners of the mortgage loans—the investors in the mortgage-backed securities—did not govern their investments by the same strict lending standards that they would observe but for the separation of origination and ownership (although this failure may at least partly be explained by (i) the inherent inadequacy of disclosure for the most complex (ABS CDO) mortgage-backed securities; (ii) the possibly excessive diversification of risk created by these securities, undermining any given investor's incentive to monitor; and (iii) the tendency of investors to engage in herd behavior).

Although I don't believe the originate-to-distribute model was a significant cause of the financial crisis, the model may need fixing to avoid its perception as the cause. There is little question, though, that the model should remain basically intact; it is critical to the underlying funding liquidity of banks and corporations, and empirical evidence tentatively indicates that it

creates net value. The goal therefore should be to minimize any potential moral hazard resulting from the originate-to-distribute model without undermining the model's basic utility.

There are various ways this might be done. Potential moral hazard problems could be managed, for example, by requiring mortgage lenders and other originators to retain some realistic risk of loss. This is the central approach of the Dodd-Frank Act in the U.S., although we have already discussed in this section of the paper how this can lead to a 'mutual misinformation' problem.

Moral hazard problems also could be managed by regulating loan underwriting standards. The United States took this type of approach, for example, in response to the margin-loan underwriting failures that helped trigger the Great Depression. When stock values began depreciating in 1929, margin loans (that is, loans to purchase publicly-listed stock) became under-collateralized, resulting in a high loan default rate which, in turn, caused bank lenders to fail. To protect against a recurrence of this problem, the Federal Reserve promulgated margin regulations G, U, T, and X, requiring margin lenders to maintain minimum two-to-one collateral coverage.

A similar type of approach applied to home-mortgage loans would certainly protect against a repeat of the recent crisis. That protection would come at a high price, though, potentially impeding and increasing the cost of home ownership and imposing an administrative burden on lenders and government monitors.

C. Servicing Conflicts.

Mortgage securitization made it difficult to work out problems with the underlying mortgage loans because the beneficial owners of the loans are no longer the mortgage lenders but a broad universe of investors in the mortgage-backed securities. Servicers theoretically bridge the gap between investors (as beneficial owners of the loans) and the mortgage lenders, retaining the power to restructure the underlying loans "in the best interests" of those investors; but the reality is problematic.

Servicers may be reluctant to engage in a restructuring, for example, if there is uncertainty whether their costs will be reimbursed; whereas foreclosure costs are relatively minimal. Servicers may also prefer foreclosure over restructuring because foreclosure is more ministerial and thus has lower litigation risk. Restructuring can involve difficult decisions. For example, in a mortgage securitization transaction in which cash flows deriving from principal and interest are separately allocated to different investor classes, or 'tranches,' a restructuring that reduces the interest rate would adversely affect investors in the interest-only tranche (and likewise, a restructuring that reduces principal would adversely affect investors in the principal-only tranche). This leads to what some have called "tranche warfare."

These problems can, and in the future should, be fixed. Parties should write underlying deal documentation that sets clearer and more flexible guidelines and more certain reimbursement procedures for loan restructuring, especially when restructuring appears to be superior to foreclosure. Parties also should try to minimize allocating cash flows to investors in ways that create conflicts. Furthermore, I have argued that non-conflicted servicers that engage in restructuring in good faith should be protected, perhaps akin to the type of protection afforded corporate directors under a business judgment rule.

D. Overreliance on Mathematical Models.

To some extent the financial crisis resulted from an abandonment of common sense and an overreliance on complex mathematical models. Models are essential to securitization because of the need to statistically predict what future cash flows will become available from the underlying financial assets to pay the mortgage-backed securities.[71]

Models can bring insight and clarity. If the model is realistic and the inputted data are reliable, models can yield accurate predictions of real events. However, if the model is unrealistic or the inputted data are unreliable, models can be misleading—creating the danger of "garbage in, garbage out."

Subprime mortgage securitization models relied on assumptions and historical data which, in retrospect, turned out to be incorrect and therefore made the valuations incorrect. The securitization models also incorrectly assumed that housing would not depreciate in value to the levels later seen.

Valuation errors were compounded to the extent mortgage loans increasingly were made with innovative terms, such as adjustable rates, low-to-zero down payment requirements, interest-only payment options, and negative amortization. These terms were so complex that some borrowers did not fully understand the risks they were incurring. As a result, they defaulted at a much higher rate than would be predicted by the historical mortgage-loan default rates relied on by loan originators in extending credit.

Securitization models also have been used, sometimes erroneously, to substitute for real market information. For example, some highly-leveraged ABS CDO securities did not have an active trading market, so investors instead relied on mark-to-model valuation of these securities. When assumptions underlying the models turned out to be wrong, investors panicked because they did not know what the securities were worth.

[71] My use of the term 'mortgage-backed securities' is meant to be illustrative, not exclusive; securitization embraces securities backed by any form of financial assets.

In theory, this overreliance on mathematical models is self-correcting because the recent crisis, by its very existence, has shaken faith in the market's ability to analyze and measure risk through models. Securitization products are likely to be confined, at least in the near future, to those that can be robustly modeled. The only question will be the longevity of the lesson that future risks cannot always be predicted through mathematical models.

The Future of Securitization

A. General Observations.

Because securitization, properly utilized, is an efficient financial tool, its future should be assured no matter how investors or politicians might temporarily overreact. Nonetheless, in the near future at least, it is likely that securitization transactions will need to refocus on basic structures and asset types in order to attract investors.

To this end, there likely will (and, I believe, should) be an emphasis on cash-flow securitizations in which there are the traditional "two-ways out." An example of this would be the securitization of prime mortgages, in which payment can come from the borrower or the collateral.

Furthermore, we are not likely to see many highly complex securitization products, like ABS CDO transactions, which magnify leverage.

But there are exciting potential new applications of securitization, such as to microfinance. Microfinance refers to providing small loans and other proportionally sized financial services to low-income individuals and the poor, in order to enable them to start or expand small businesses. Microfinance loans are now being made domestically and around the world, with estimates of between $20 and $60 billion outstanding. As a result of microfinance's success, the need for microfinance lending vastly exceeds the amount of funds that can be raised from charitable donors. It has been estimated, for example, that of the one-and-a-half billion people potentially eligible for microfinance loans, only a hundred million people—less than seven percent—receive them.

To satisfy this demand, commercial banks have become vital funding sources for microfinance loans in many countries. But many of these banks are charging exorbitant rates of interest, with some charging interest rates of 100 percent or more.

I have recently argued that securitization can, and indeed should, be applied to microfinance to disintermediate the need for commercial banks. Even profit motivated investors should want to invest in microfinance lending as a means of diversifying their portfolios, thereby protecting themselves from market risk. The challenge, though, is to ensure that microfinance

securitization transactions are structured with the lessons of the failure of subprime mortgage securitization in mind,[72] and to resist political pressures to cut corners.

In the medium term, securitization's future will be at least marginally influenced by the extent to which the intrinsic values of mortgage-backed securities turn out to be worth more than their market values. I have argued that, as a result of irrational panic, the market prices of mortgage-backed securities originally collapsed substantially below the intrinsic value of the mortgage loans underlying those securities. A large differential would indicate that the problem was more investor panic than intrinsic lack of worth; although the subsequent collapse of the real economy to some extent has made the price collapse a self-fulfilling prophecy by causing even prime borrowers to lose their jobs and default.

Whether securitization will remain vibrant and inventive in the long term, however, will turn on our ability to better understand the problems of complexity, which was at the root of many of the failures that gave rise to the financial crisis.

B. Alternatives to Securitization.

Covered bonds, which have a long history in European securities markets, are being widely touted as an alternative to securitization. By the end of 2008, the amount of covered bonds outstanding in Europe alone was approximately 2.38 trillion euros, up from 1.5 trillion euros in 2003.

There is no formal international convention or treaty defining covered bonds. They are instead defined, de facto, by their characteristics. Essentially they are long-term debt securities that are secured by specific assets of the issuer of the bonds. The assets so constituting collateral are called "cover-pool" assets. To the extent the cover-pool assets are insufficient to repay principal and interest on the covered bonds, investors in the bonds have an unsecured claim against the issuer for the insufficiency ('dual recourse').

As with any granting of collateral, the cover-pool assets are deemed to remain on the issuer's balance sheet (i.e., they remain owned by the issuer) for accounting purposes. Unlike normal collateral, however, these assets are "ring-fenced"—effectively segregated from the issuer's estate—to give covered bondholders greater protection in the event of the issuer's bankruptcy. Additionally, weak cover-pool assets are required to be replaced by good-quality assets throughout the life of the covered bonds, thereby maintaining a requisite level of "overcollateralization"—a surplus of collateral value over indebtedness. To ensure this is all enforceable by covered bondholders against other creditors of the issuer, some countries have promulgated specific covered bond legislation (a "legislative" covered bond regime). Absent

[72] See Disintermediating Avarice: A Legal Framework for Commercially Sustainable Microfinance, 2011 U. ILLINOIS L. REV., issue 4, available at http://ssrn.com/abstract=1612766 (discussing 'Risk of Loss' in Part III.F thereof).

such legislation, covered bondholders must rely on contractual protections and related commercial law (a "structured" covered bond regime).

Covered bond and securitization transactions have significant similarities. The most important is that both strive for bankruptcy remoteness—the goal of protecting covered bond investors in the event of the issuer's bankruptcy. Covered bond transactions strive to achieve bankruptcy remoteness through ring-fencing or by legislative fiat. Securitization transactions achieve bankruptcy remoteness by having the company originating the receivables (the "originator") transfer those receivables, in a "true sale" under bankruptcy law, to a bankruptcy-remote SPV—steps that can parallel ring-fencing.

Another important similarity is that after covered bondholders are paid in full, and also after securitization investors are paid in full, any residual value from the transferred assets is returned for the benefit of other creditors.

There are, however, several differences between covered bonds and securitization. A primary distinction is that covered bonds have dual recourse, whereas securitization constitutes non-recourse financing. Another distinction is that, in covered bond transactions, the cover-pool assets typically remain on the issuer's balance sheet for accounting purposes whereas, in securitization transactions, it has been more typical for the transfer of assets from the originator to the SPV to be accounted for as a sale.

This accounting distinction is somewhat artificial, however. Securitization transactions can be—and increasingly are—structured as on balance-sheet transactions. The absence of an accounting benefit does not undermine securitization's key fundraising and risk-transfer functions. The dual recourse distinction, however, is more critical.

Securitization, much like a new-money loan, would not harm unsecured creditors of a company to the extent it entails the exchange of one type of asset (e.g. mortgage loans, automotive loans, or other financial assets) for another asset, cash. But unsecured creditors can fare differently when a company issues covered bonds. Covered bonds are roughly equivalent to a securitization in their neutral immediate impact—unsecured creditors would only be harmed to the extent a covered bond issue increases the issuer's chance of bankruptcy or there is overinvestment of the proceeds of the bond issue. Covered bonds, however, go beyond securitization in two ways that can harm unsecured creditors.

In a securitization, if the overcollateralization is insufficient to repay investors, the investors suffer a loss because they only have recourse to assets that the SPV has already purchased. The pool of assets available for repayment is, in other words, effectively fixed or static. In contrast, in covered bond transactions, the cover pools are usually dynamic, requiring the covered bond

issuer to continually segregate new assets as needed to maintain overcollateralization—thereby enabling the covered bonds to continue to be paid in priority to unsecured claims.

Covered bonds also go beyond securitization in their recourse. Whereas securitization transactions are non-recourse, covered bonds have dual recourse. If, therefore, the cover-pool assets are insufficient, covered bondholders have a recourse claim against the issuer. That claim, being *pari passu* with unsecured creditor claims, would further dilute unsecured creditor recovery.

As a result of the dynamic cover pool and dual recourse, covered bond transactions thus shift virtually all risk to unsecured creditors. The extent to which risk should be allocated so asymmetrically is an important policy question that should be addressed by any governments and market participants exploring covered bonds as an alternative to securitization.

The Global Financial Collapse and the Path to Minskian Reform

By L. Randall Wray

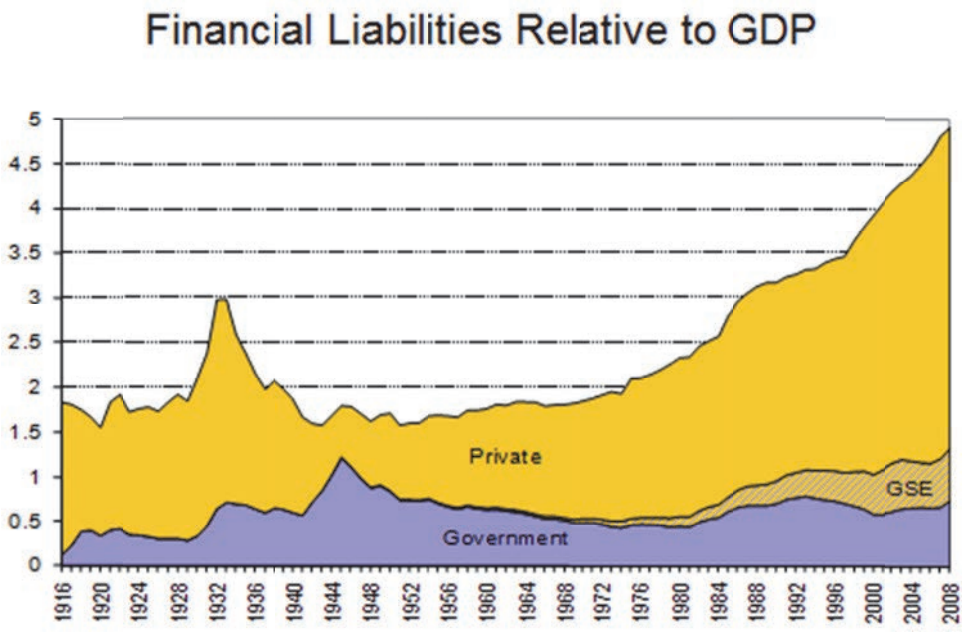
Public discussion of the roots the financial crisis has already faded into the background, as the media and policy-makers proclaim we are on the (slow) road to recovery. Likewise, the political moment for restructuring the financial system and its institutions has passed. Dodd-Frank was always insufficient, but it is being further weakened by insiders as regulators attempt to put Congressional intentions into practice. No major players in the financial world have been prosecuted for their roles in the crisis; and Wall Street is back to claiming its 40 percent share of all corporate profits.

The real world economic devastation wrought by the crisis, however, lingers on—as does the underlying brittleness of the financial system. That is especially evident in Euroland, which looks like it might not survive the next few weeks. It is entirely possible that the European crisis will spill-over to the U.S. and bring on the Global Financial Crisis (GFC) 2.0. So although the prospects of further reform are now dead in the U.S., we should prepare ourselves for the next crisis—for the next opportunity to revive the financial structure debate—by learning the right lessons from the last crisis.

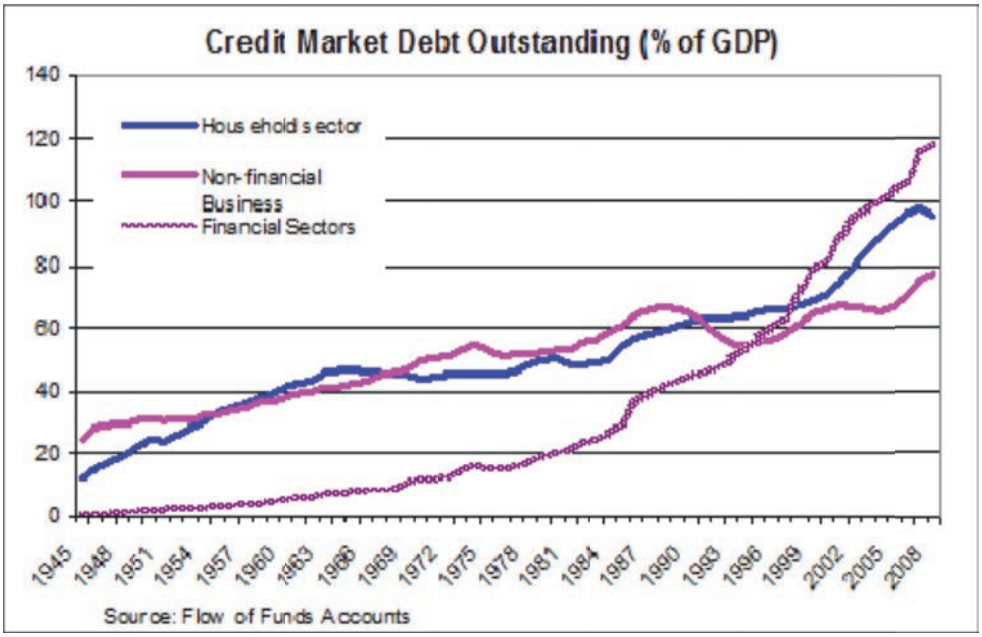
Doing so, however, requires figuring out what went wrong in the first place. The work of Hyman Minsky allows us to look beyond the details of the subprime mortgage crisis to the underlying conditions that have made the economy susceptible to "It" (a debt deflation and great depression) happening again. His work also suggests a possible blueprint, for restructuring the financial system and rebalancing the economy—away from speculation and fraud and toward real improvements in living standards.

The high rate of defaults in subprime mortgages can be accurately fingered as the key trigger for this latest crisis, but for anyone interested in preventing the next crisis, the problems run much deeper than the subprime mess. In fact, the financial system was already so fragile that the triggering event could have been anything. The total subprime "universe" was less than two trillion dollars--modest relative to U.S. GDP; the number of defaults was not sufficient to explain a crash of the magnitude that occurred. What allowed these events to precipitate a global financial panic and to threaten debt deflation was a long-term transformation of the economy toward instability; a shift traced by Hyman Minsky since the 1950's. It is only by addressing this underlying structural instability that we can prevent "It" from happening again. In the absence of such fundamental reform, we should expect the next crisis to be right around the corner, and for it to be worse than the last one.

The story of the GFC cannot be told without reference to the "financialization" of the economy. One measure is the rising share of GDP flowing to the financial sector—20 percent of value added. Another is total U.S. debt (of all types) that rose to five times GDP—from just over 150 percent of GDP at the end of WWII. The previous peak, in 1929, was "only" three times GDP, as shown in the next figure.



Financialization is marked by increasing leverage, piling debt on top of debt, and more and more complex linkages between financial institutions; essentially an explosion of financial layering in which financial institutions borrow from each other to lend. Mortgage backed securities played a big role, since next to Treasuries these were the most important form of collateral behind all the leveraging. While rated AAA, MBS' riskiness suddenly was questioned when the first bad news about subprimes surfaced in early 2007. If the collateral was no good, then short-term finance would suddenly disappear. These linkages created the conditions under which the failure of an institution like Bear Stearns or Lehman Brothers could result in the sort of toppling of dominoes that occurred in the financial sector. A look at the ratio of financial institution liabilities to GDP, a decent measure of financialization, reveals an entirely unprecedented acceleration in the last couple of decades—as shown here:



Minsky's earliest work from the 1950s focused on the increasing role played by financial institutions—and he noticed increased layering of financial debt upon financial debt as early as the mid-1960s. He warned that this development made the system increasingly fragile. While he is best known for his "financial theory of investment and investment theory of the cycle," Minsky's financial instability hypothesis came to be focused on the long-term transformation of the economy toward a stage he called "money manager capitalism" (Minsky 1986, 1992a, 1992b, 1992c, 1992d; Minsky and Whalen 1996; Sen 2010b; Wray 2008a, 2009). Money manager capitalism is marked by the potential for deep instability, with massive pools of funds directed by professionals seeking the highest returns possible generating successive speculative bubbles in stocks, real estate, and commodities. Examples include pension funds, sovereign wealth funds, mutual funds, and insurance funds. Pension funds alone grew to about three-quarters the size of GDP. These huge managed pools of money, including those managed in highly leveraged "shadow banks," were (a) for the most part unregulated, and (b) able to compete with regulated banks—pushing a competitive "race to the bottom". Deregulation in the banking sector was in part a reaction to this competition from shadow banks. The creation of highly leveraged and largely unregulated special purpose vehicles, for instance, can be attributed to an attempt by banks to keep up with the shadow banking sector, which did not labor under minimum capital and reserve requirements. The creation of these off-balance sheet entities ended up being crucial to the recent collapse, as these entities took huge risks without supervision; those risks came back to banks when the crisis hit. It is difficult to imagine how we could have had the GFC without the rise of money managers and shadow banks.

Alongside the move toward greater financialization and the development of Minsky's money manager stage of capitalism were the effects of stagnating real wages and rising inequality. Real median wage growth has been nearly flat since the early 1970s, as productivity gains flowed largely to the top of the income distribution. This stagnation led to increasing household indebtedness as the average family struggled to maintain its living standards (Wray 2005). And as lending standards relaxed, and as house prices boomed, consumption was fueled by home equity loans. In fact, roughly half of subprime and "Alt-A" (a step below prime) loans were for second mortgages or cash-out refinancing of homes to finance consumption, not ownership. The use of homes as "ATMs" played a huge role in fueling debt-led consumption (adding several percentage points to national GDP in the mid-1990s); when that source of finance dried up, consumption collapsed—and has remained depressed, which is why a real recovery cannot get underway.

In other words, while finance was metastasizing, the "real" economy had withered. High inequality and stagnant wage growth tends to promote "living beyond one's means" as consumers try to keep up with the lifestyles of the rich and famous. When this was combined with lax regulation and supervision of banking, we got a debt-fueled consumption boom. Add a fraud-fueled real estate boom and we had set up the fragile conditions that made the GFC possible.

Minsky's view is that the transformation of the economy and its financial structure from robustness to fragility is not due to factors external to the market, like government intervention and regulation, but is rather a result of the "normal" operations and incentives of financial capitalism. The potential for transformation toward fragility is ever-present, because it is internal to the functioning of the economy. Minsky argued that the very "success" of this economy, its upward euphoric booms, accounts for its truly dangerous instability because they make a 1929-style crash possible. Stability is destabilizing, as he always said.

The solutions to these problems, in both finance and the real economy, lie beyond markets. Rebalancing the economy requires a restructuring and reregulation of the financial system, along with government policies to promote and guarantee full employment. Before we turn to these solutions, we need to dwell on some of the more particular lessons we ought to have learned from the previous GFC.

While some analysts blame the Federal Reserve for keeping the interest rate too low and thus promoting speculation, this is mostly wrong. As John Kenneth Galbraith pointed out in his analysis of the great crash, low interest rates do not necessarily fuel speculation (Galbraith, 1961). In any case, the Fed had already turned to raise interest rates in 2004, and most of the

worst abuses in real estate markets occurred after 2004. Raising interest rates in a bubble will not have much impact, because the prospective earnings in a bubble swamp any 400 basis points increase in interest rates—which would be a rather large rate hike that would take a couple of years to phase in (since the Fed had moved to a policy of "gradualism," a series of small hikes, when it adopted the New Monetary Consensus).

Second, this was not simply a liquidity crisis, but rather a massive insolvency across the largest banks, shadow and otherwise. The banks had an insufficient supply of good assets to offer as collateral against loans; just trashy real estate derivatives plus loans to each other, all backed by nothing other than a fog of deceit. All it took was for one gambling banker to call the bluff. As default rates rose, banks realized not only that they held shoddy mortgage products, but that other banks and financial institutions did as well. Consequently, they refused to roll over short-term liabilities, stopped lending to one another, and the whole financial-layering-supported scheme collapsed. This was not a matter of some "global missed payment." In fact, the major banks are probably *still* insolvent; propped up only by the backing provided by the U.S. Treasury and the Fed.

Third, the "efficient markets hypothesis," which tells us (among other things) that markets will discover the proper prices of securitized loans, failed. There is, in other words, no substitute for good underwriting, for determining credit-worthiness and creating incentives for predictable repayments. Over the last decade, the largest institutions involved in home finance reduced their underwriting standards, or eliminated them entirely—hence the absurd NINJA loans (no income, no job, no assets). Underwriting standards, when they depend upon "market discipline" alone, should be expected to deteriorate; as they did in this latest crisis and those before it as Gresham's Law dynamics are always fueled by profit-seeking behavior in a boom. When some asset class is booming, lenders come to expect that the prices of those assets will continue to rise. They will then lend more relative to value, current income, and expected cash flow because asset price appreciation makes most loans good. If things do not work out, loans can be refinanced or the collateral can be seized and sold. It goes on until someone questions the boom—and starts to sell assets or refuses to roll over debt. The discovery that assets are probably overvalued causes prices to reverse course and then to collapse, so borrowers sink underwater and lenders are left insolvent. A run on uninsured liabilities then begins.

In the GFC, "depositors" in money market mutual funds began to worry about "breaking the buck" (the funds would not be able to guarantee that a dollar of their liabilities would be worth a dollar), causing a run. Similarly, shadow banks that relied on "rolling over" very short-term liabilities (including commercial paper) found rising "haircuts" (the discount applied to their collateral) so that they could not refinance positions in assets. That led to "fire sales" of assets,

declining asset prices, and a general liquidity crisis. More importantly, as discussed above, it was recognized that assets had been tremendously overvalued—so even with Treasury extensions of guarantees (to money market mutual funds, for example) and trillions of dollars of lender of last resort activity by the Fed, no one wanted to refinance banks and shadow banks. Since they relied on each other (rather than on depositors), financial institutions discovered the dangers of "interconnectedness." They tried to delever, to sell toxic assets to the Fed (in Quantitative Easing I), and to unwind positions.

The current tightening of loan standards is not evidence that banks have learned their lesson, but is simply a natural reaction to the crisis. Absent any serious regulatory measures ensuring otherwise, underwriting standards will gradually wither away and disappear as the next euphoric boom emerges. "Market discipline," such as it is, perversely produces insufficient underwriting, and then in turn inadequate lending, when underwriting and liquidity are needed most (underwriting at the height of euphoria, and liquidity in the wreckage of a bust).

Finally, policy makers must recognize that the activities leading up to and through the crisis were riddled with fraud. Fraud, at multiple levels, became normal business practice; from lender fraud and foreclosure fraud, to the practice of duping investors with bait-and-switch tactics into buying toxic securities while simultaneously betting against those securities using credit default swaps. Every layer in the home finance food chain was not only complex, but also fraudulent; from the real estate agents to the appraisers and mortgage brokers who overpriced the property and induced borrowers into terms they could not afford, to the investment banks and their subsidiary trusts that securitized the mortgages, to the credit ratings agencies and accounting firms that validated values and practices, to the servicers and judges who allow banks to steal homes, and on to the CEOs and lawyers who signed off on the fraud. Once a bank has made a Liar's Loan, every other link in the home finance chain must be tainted. And that means every transaction; every certification; every rating; and every signature all the way up to the CEO of the investment bank is part of the cover-up.

During the thrift fiasco, the fraudsters were finally shut down, more than a thousand were jailed, and the Bush (Senior) administration resolved the crisis with an infusion of about $200 billion, using the Resolution Trust Authority. While the "bailout" was imperfect, at least that time it stopped the fraud, closed the worst thrifts, and jailed many of the crooks. So far, in this much bigger crisis, we have done none of those things.

Should the next crisis create the necessary sense of urgency, the following reforms in both finance and the "real" economy should be pushed. The long-run U.S. trend has been to consolidate a wide range of services within the affiliates of a bank holding company. The New

Deal reforms had separated institutions by function (and state laws against branching provided geographic constraints). Natural evolution plus deregulation allowed the growth of a handful of dominant behemoths that play a key role in the provision of all of these services.

Since economies of scale exhaust themselves fairly quickly in banking, as Minsky and others have argued, there ought to be a presumption in favor of limiting the size of banks. Larger institutions are much harder to run, regulate and supervise. This creates incentives for the development of control frauds, in which owners are duped while managers are enriched. The supposed benefits and "synergies" that were to flow from bank consolidation and extension of scope have mostly been opportunities for institutions to bet against their own customers. Charles Keating's Lincoln Savings used its FDIC seal of approval to sell risky and ultimately worthless assets to its elderly widows who thought they were buying insured certificates of deposit (CDs). More recently, Goldman Sachs allowed hedge fund manager Paulson to design sure-to-fail synthetic collateralized debt obligations (CDOs) that Goldman sold to its own customers, allowing both Goldman and Paulson to use credit default swaps (CDSs) to bet on failure (Eisinger and Bernstein, 2010).

Financial institutions should be offered a choice between either holding a bank charter or engaging in speculative trading—but should not be allowed to do both. Investment banks would not be allowed to "play with house money" (FDIC-insured deposits) and chartered banks would be prohibited from securitizing. Chartered banks ought to be treated and regulated as public utilities, serving public purposes, and if as public utilities they are going to have access to government guarantees and Fed lending, then they should not be engaged in the kind of securitized lending that undermines solid underwriting. In this vein, banks ought to be required to hold loans to maturity. There is no legitimate reason why banks should move assets off their balance sheets. There is no need to make securitization itself illegal, but banks shouldn't be allowed to do it.

Banks should ultimately have a narrow focus and a limited set of operations. For instance, business functions not related to commercial and residential real estate mortgages and the making of short-term commercial loans should be prohibited. Other financial institutions may engage in activities beyond this narrow scope, but if they do so they should not be provided with government backstops or guarantees.

For those institutions, including investment banks, that will engage in trading, we must change their incentive structures in order to promote better underwriting. It will be very difficult to reorient investment banking towards a long-term horizon with proper underwriting when debt is securitized and subject to lax oversight and when the average stock is held less than a year

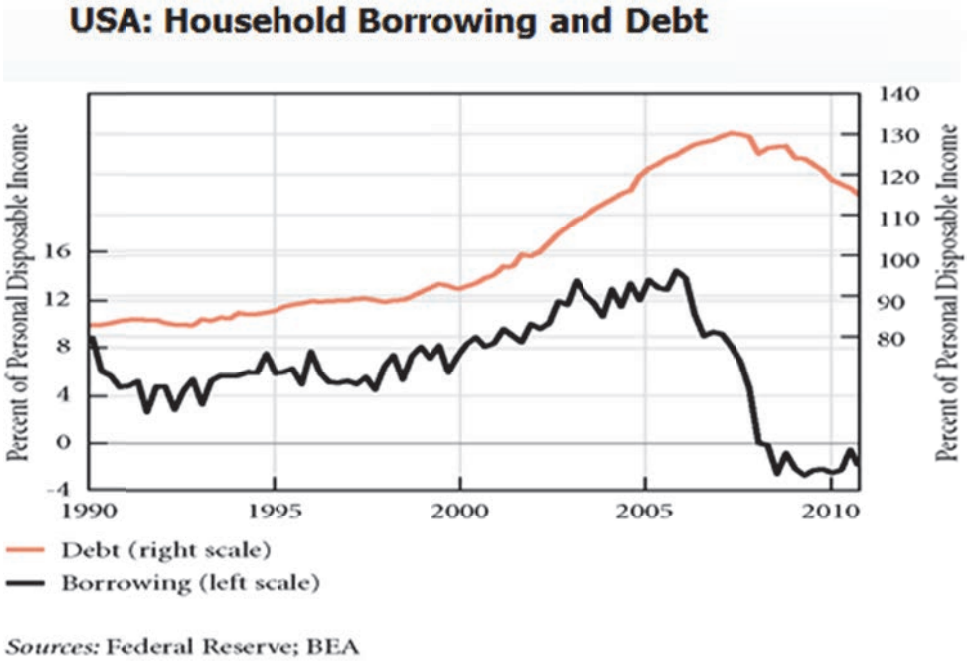
(and the stock market taken as a whole is a negative source of funding of capital assets, because firms are caught up in the casino, purchasing their own equity to share in the gains of a speculative bubble). Still, it is necessary to do so.

Compensation for managers and traders at investment banks should be linked to long-term results. For instance, compensation could be tied to five-year income flows with "clawbacks" in the case of losses. Investment banks should ultimately be reoriented toward playing more of an intermediary role, through holding long-term debt and issuing their own debt to savers. Attempts to impose higher capital ratios, such as those mandated in Basel III, do not provide the necessary discipline—investment banks that "originate to distribute" do not hold the relevant assets on their books anyway.

Paired with these reforms of the financial sector, we can also address the cyclical and long-term unemployment problem. Minsky developed an "Employer of Last Resort" (ELR) policy, in which the government provides a job guarantee to all who are willing and able to work (Minsky 1965, 1986; Kelton and Wray 2004; Wray 1998). The program would offer a job at the minimum wage, plus benefits, with no time limits and no income, gender, education, or experience requirements. Funding would be provided by the federal government and administration would be decentralized, with state and local governments, as well as nonprofits, proposing projects. Project proposals will be evaluated on the following criteria: a) value to the community, b) value to the participants, c) likelihood of successful implementation of project, and d) contribution to preparing workers for non-program employment.

The program is not designed as a one-shot solution to a cyclical downturn, but as a permanent feature supporting the labor market. In an expansion, employers would recruit and hire workers out of the program; in a downturn, the guaranteed job ensures a secure flow of income for those who are laid off. It also provides training and experience for those who cannot otherwise find a job. By supporting full employment, the ELR aims to reduce inequality and promote income-supported (rather than our latest private debt-fueled) consumption.

The conditions that held in 2007 have been replicated, and we are, once again, just waiting for the trigger. The bailout has increased the linkages among the top four or five banks, making the system even more fragile. We've lost eight million jobs, opening a demand gap of about $1 trillion. Although some households have defaulted on their debts, and others have repaid portions, most of the household debt held in 2007 still exists, as shown in the next figure.



Sources: Federal Reserve; BEA

Against this background, there are multiple events that could trigger a new, potentially deeper crisis. Should information leak out that one of the major U.S. banks is insolvent (a proposition believed by many analysts), another massive liquidity crisis would be likely. Alternatively, the problems could start in Europe and ripple into the US: for example, there is a plausible path that can be traced from U.S. money market mutual fund holdings of Eurobank assets to a new global financial shock. Last time, the US government extended the guarantee to all of them; Dodd-Frank outlaws such intervention. So appearance of a problem among Eurobanks could bring down that whole market.

Far-reaching reform along the Minskyan lines traced above will likely only be conceivable in the aftermath of the next crisis. Fortunately, and unfortunately, that opportunity may be right around the corner.

Concluding Remarks

This White Paper demonstrates that history can be a good teacher. If ignored history tends to repeat itself. The paper documents several instances where history has been ignored and lessons learned in the past forgotten. We know residential housing markets do not always go up in value. We know people are more likely to pay their bills in the future if they have a solid history of paying their bills in the past. We know lenders need to rely on observable credit histories when considering loan applicants. We know sellers of credit-related derivatives are unmotivated to be forthcoming about the underlying details of derivative transactions unless pushed by investors to do so.

We hope the insights gained from the contributions of our invited authors will stimulate discussion among all participants in the residential housing markets. It is clear from recent economic results that these markets are working less than optimally. Since investments in these markets are a key piece of the investment portfolio of insurers, it is important to insurers, consumers and insurance regulators that these markets become more functional and reliable.

Following the global financial crisis, politicians were calling for greater transparency, enhanced disclosure and more regulation as solutions to address the credit crisis. As David Rowe observes in his contribution to the paper, there was plenty of blame to go around. This outcry led to the enactment of the Dodd-Frank Wall Street Reform and Consumer Protection Act (DFA). One of the features of DFA was the chartering of the Financial Stability Oversight Council (FSOC) and its research arm the Office of Financial Research (OFR). Together they were tasked with identifying and documenting risks to the U.S. financial system, promoting market discipline, collecting information needed to assess risks to the U.S. financial system, and coordinating regulatory oversight and information sharing for the financial sector. The housing markets and the related RMBS markets are but one piece of a broader puzzle. It is our sincere hope that this White Paper is of assistance in the greater public policy debate. We believe the suggestions contained within it merit consideration as part of a broader solution made feasible by today's technology advances and knowledge of the shortcomings of current market tools.

While each of the invited authors brings a unique perspective to the paper, there are some areas of agreement among them. First, all agree the current system is less than optimal with regard to information available to assist investors in making an informed decision when considering the purchase of a RMBS or monitoring current RMBS performance. All the contributors mention issues with transparency and disclosure to investors and regulators. All of

the contributors, except Randall Wray, were in favor of improving RMBS markets rather than returning to a lend-and-hold model.

Richard Field's Brown Paper Bag Challenge paints a clear picture of why it is so important for efficient markets to have access to current collateral performance information. He recommends the centralized collection of observable event-based reporting which he defines in his section of the paper. In essence, the observable event-based reporting would require over-night reporting of every activity involving the underlying mortgage loans. His belief is that the overnight reporting of observable events would overcome the information asymmetry problem identified by Mr. Field and others. He characterizes the current monthly or less frequent reporting as equivalent to an exercise of blind betting on the contents of a brown paper bag. According to Mr. Field, investors with access to observable event reporting would be able to make informed decisions about whether to buy, sell or hold RMBS as they are valuing the contents of a clear plastic bag. He also stresses the importance of insurers and other investors knowing what they own. This can be facilitated by the observable event based reporting.

Mr. Field cites three primary reasons why observable event-based reporting is superior to today's monthly or longer reporting. First, it is consistent with how lenders track information from borrowers in databases designed for other uses. This would mean minimal expenses associated with reporting these events to others. Second, observable event-based reporting would allow investors to monitor performance of underlying assets as often as they choose. Finally, it would eliminate the informational asymmetry and related information advantage of originating firms.

David M. Rowe discusses the complexity and challenges of risk assessment of complex financial products, including RMBS. The heterogeneity of risk and performance in the underlying assets further complicates the picture. Thus, he recommends greater uniformity among underlying financial instruments to improve homogeneity. He observes that sellers have no interest in being more transparent as they perceive a competitive advantage created by information asymmetries. Mr. Rowe correctly observes that technology is now available that is capable of handling the volume of information needed to counter the information asymmetry advantage of deal originators. However, the technology will only be developed if there is a call to arms by an alliance of buyers, regulators and the general public. He suggests market-driven transparency as the answer. Mr. Rowe mentions an intellectual property company, Marketcore, as a thought leader in this area.

Mr. Rowe's vision would include an electronic transaction system to capture initial RMBS transactions along with any subsequent structural details. He favors a private sector, rather

than government solution and his section identifies important partners necessary to build such a system. He encourages the use of Marketcore's Transaction Credits™ model to encourage system use by market participants. This key feature would be the tool used to provide incentives to originators, aggregators and investors to encourage them to use the system and to report events related to the value of underlying mortgages. If a regulator portal were added, then the multiple eyes of state insurance regulators would assist with keeping all parties honest and provide a valuable risk valuation tool for all financial regulators.

Edward Toy mentions how important it is for public policymakers to decide to what degree universal home ownership is an economic imperative for the United States. He observes that the Dodd-Frank Act takes a dim view of NRSROs and insists federal regulators remove any reference to NRSROs in federal guidance. As a practical result, banks and securities firms will not be able to refer to NRSROs in their risk management practices. He points out that this decision conflicts with international efforts where Basel II/III doctrines base capital requirements on NRSRO ratings.

Mr. Toy favors the risk retention rules in Dodd-Frank, but observes the lack of specificity in the rules initially drafted might allow originators to game the system by retaining only the very best risks for themselves. Mr. Toy comments on the potential unwinding of Fannie Mae and Freddie Mac. He believes the extreme of having them cease underwriting any new transactions is unlikely as it would cause a profoundly negative impact on the U.S. economy and RMBS markets. This, he says, is unlikely to happen. He does expect that whatever policymakers decide, the federal involvement in supporting residential housing markets will be less than it was at its peak and will involve greater due diligence on underlying loans. He says the U.S. insurance regulatory system has effectively distanced itself from NRSRO influence by the use of risk-focused examinations favoring strong analytics over NRSRO reliance and by assigning NAIC Designations mapped to Risk-Based Capital factors.

In addition to his discussion of RMBS, Mr. Toy also discussed other structured securities. He believes investment in structured securities will be an important component of insurer investment portfolios in the future. He mentions the use of covered bonds in Europe and other countries throughout the world. He notes pending legislation that would authorize their use in the United States. He concludes, "There is no reason to believe that asset-backed securities will not continue to be an important part of the U.S. insurance Industry's investment strategy going forward."

Steven L. Schwarcz discusses the role of securitization in the recent financial crisis. He identifies several issues with regard to RMBS including; a problematic asset type (subprime mortgages);

the moral hazard associated with an originate-to-distribute model; conflicts of interest when dealing with mortgage servicers; and overreliance on faulty modeling assumptions. Mr. Schwarcz offers fixes for some of the issues, suggesting government regulation of loan underwriting standards to address the moral hazard issue. He would address the servicer issues by requiring clearer and more flexible underlying deal documentation and establishing reimbursement procedures for loan restructuring. He believes the overreliance on mathematical models is self-correcting as the market will learn from its past mistakes.

Mr. Schwarcz sees a bright future for securitization as a necessary and efficient financial tool. He encourages dealmakers to get back to basics and avoid risky asset classes and complex deals. Like Mr. Toy, Mr. Schwarcz comments on the possibility of introducing covered bonds into the U.S. markets as an alternative to traditional securitizations. He recognizes the preferable way to introduce them would be for legislative action to amend bankruptcy codes to recognize the priority status of covered bond holders. However, he also believes the covered bond could be introduced without legislation. If this were to occur, parties would have to rely on the contractual provisions regarding priority and hope the terms would not be challenged in Court.

L. Randall Wray discusses the role of MBS in the global financial crisis. He observes that, next to Treasuries RMBS were the most important form of collateral behind all the leveraging. He believes what he terms “financialization” is the root cause of our economic woes. He describes this problem as one where the growth in the financial sector coupled with the level of debt has led to increased linkage among financial institutions along with an unsustainable ratio of debt to GDP. This leveraging, he concludes serves to make our economy very fragile and subject to future problems. He adds the use of houses as a source of easily accessible funds played a huge role in fueling debt-led consumer consumption. When that source of finance dried up, consumption collapsed and has remained depressed.

Mr. Wray recommends more regulation in the future including limiting the size of banks. He notes larger institutions are much harder to run, regulate and supervise. He suggests financial institutions should be required to choose between either holding a bank charter or engaging in speculative trading, but not both. He goes so far as to suggest banks should not be allowed to engage in securitization—essentially a return to the lend-and-hold model. Mr. Wray also recommends that compensation for managers and traders at investment banks be linked to long-term results instead of each transaction. He suggests requiring a reorientation where the investment bank retains some or all of its debt rather than off-loading it through securitization. The role of government would expand by creating an employer of last resort with job guarantees for everyone. These employees would work on government and non-profit projects

managed locally and funded by the federal government. Mr. Wray maintains that conditions now are the same as in 2007 and the shoe is simply waiting to drop on our economy again.

There are two ways to implement change in the way the RMBS market performs. Government can enact laws and regulations requiring the reporting of certain data and insist on a level of transparency that sellers of RMBS must meet, or the private sector can recognize the market is not working well and an alliance of buyers, regulators and the public can insist on greater transparency and effective disclosure of sufficient information to allow RMBS investors and regulators to have greater confidence in the market. If a private sector solution is developed, insurance regulators could influence its success by providing greater credence to assets traded through a mechanism that makes price transparent than those traded using traditional market mechanisms or provide collateral performance disclosure on a more frequent basis. Regulators might want to give greater credence, perhaps in the way of reduced capital requirements, to insurers who invest in assets with greater transparency both through more frequent disclosure and increased availability of pricing. Improving transparency would be a good thing for insurers, regulators and the capital markets.

Perhaps a less aggressive step might involve improvements to RMBS modeling capabilities. From an insurance regulatory perspective, the goal is to improve the knowledge insurers have regarding their RMBS holdings. The true value of RMBS holdings should be readily available to insurance regulators charged with monitoring solvency. The authors hope this information will be useful to policymakers as they consider improvements to the markets and to the regulatory toolkit insurance regulators employ to monitor insurer RMBS holdings.

Some of the ideas presented by the invited authors go beyond simply addressing RMBS markets. Perhaps improvements to the RMBS markets will provide insights into how to repair markets for other asset classes.

It was George Santayana, a Spanish born American philosopher who said, “Those who do not learn from history are doomed to repeat it.” This paper traces four major instances where we have demonstrated that Santayana was correct. It is the author’s hope we can avoid a fifth repeat of history.

Hopefully this paper has presented some possibilities worth pursuing to reach a workable solution that improves market performance through increased standardization of financial instruments, improved transparency and more meaningful, and perhaps more timely, disclosure of information to investors, regulators and the general public. True competition

works best when information asymmetries are minimized or eliminated. Transparency to regulators is a must.

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APPENDIX

Land Use and Private Property

The wide distribution of land to as many individual owners as possible was paramount to the Founding Fathers of the country who wanted to avoid the immense concentration of power as represented by the British Crown. Greatly influenced by the liberalism of the Enlightenment, the major architects of the Declaration of Independence, such as Thomas Jefferson, defended peoples' rights against the absolute and arbitrary power of the King. Jefferson claimed that colonists were freemen who had earned their right to land through their labor rather than any grants by the British Crown. Embracing John Locke's ideas of individual private property as a fundamental and natural right, Jefferson opposed the notion of royal divine ownership and the system of feudal landholding, favoring instead allodial rights to property, which meant that land should be held by individuals in absolute dominion free of any obligation to a superior.[73] The Founding Fathers believed that widespread private land ownership, besides enhancing distributive justice, promotes economic growth and prosperity by allowing the full utilization of nature's greatest resource.

Popular hostility to the antiquated feudal system of land-tenure in colonial America in which quitrents (rent payments) were paid by settlers to the Crown or large proprietors for using the land, provided support for the revolutionary cause.[74] Along with the overthrow of royal authority, the payment of quitrents was abolished by the American Revolution as incompatible with a land tenure system of a free people. One of the first acts of George Washington's administration was to put public lands ceded by Great Britain up for sale to repay the national debt.[75] In the first 25 years of its existence, the United States federal government acquired claims to 233 million acres of land.[76] Congress established the Land Office to administer the privatization of public lands through auction sales transferring ownership to private individuals and states.[77]

[73] Hargrove, E.C. 1944. "Foundations of Environmental Ethics." Denton, Texas. University Of North Texas.
[74] Beverly, W.B. Jr. 1912. "The Quit-Rent System in the American Colonies." *The American Historical Review* Vol. 17. No. 3, pp. 496-516.
[75] The Public Debt Act of August 4, 1790 declared that the proceeds from the sale of the public lands "are hereby appropriated toward sinking and discharging the [national] debts."
[76] Anderson, G.M. and Martin, D.T. 1987. "The Public Domain and Nineteenth Century Transfer Policy." Cato Journal, Vol. 6, No. 3 (Winter 1987)
[77] Bureau of Land Management. U.S. Department of the Interior

When the U.S. Constitution was written, the issue of land ownership and the government's role in regulating land use were addressed in the Property Clause of Article IV,[78] which gives Congress authority over the lands and territories of the United States.[79] This authority was balanced in practice with the founders' desire to limit the reach of the federal government in favor of state rights. To the new federal authorities, direct land regulation was intended to be a more personal and local matter.

The legal protection of private property was explicitly stated in the Fifth Amendment to the Constitution, part of the Bill of Rights, which established that no person can be deprived of property "without due process of law; nor shall private property be taken for public use, without just compensation."[80] While private interest is unambiguously established and defended by this amendment, the concept of public interest and use is also clearly recognized. The Fifth Amendment, written by James Madison, moderates the absolute notion of allodial ownership favored by Jefferson by subjecting private property to the government's eminent domain[81] (the power to appropriate private land for public use).

Until the late 1860s, the U.S. government had created a vast Public Domain with the acquisition of lands through state cessions, treaties with Native American nations, and purchases from foreign countries, such as the Alaska and the Louisiana purchases. By 1867, the federal government had acquired 2.3 billion acres of which, several hundred million were sold or otherwise transferred to private interests (firms and individuals).[82] The purpose of selling off public lands was threefold. One was to generate much needed revenue for the federal government. The second was to encourage settlement and exploitation of the western lands and the third was to commodify land and its products through the development of an open market which would be a great boon to the new economy. Ultimately, the federal government, through sales and transfers, disposed of 1.3 billion acres.[83]

Along with the privatization and development of a land market, the need for conservation was recognized with the U.S. Congress reserving lands for federal purposes. The first national park,

[78] The Property Clause reads: The Congress shall have Power to dispose of and make all needful Rules and Regulations respecting the Territory or other Property belonging to the United States.
[79] Congressional Research Service Report RL34267. 2007. "Federal Land Ownership: Constitutional Authority and the History of Acquisition, Disposal, and Retention."
[80] The Constitution of the United States of America. National Archives.
[81] The United States Department of Justice. "History of the Federal Use of the Eminent Domain."
[82] Congressional Research Service Report RL34267. 2007. "Federal Land Ownership: Constitutional Authority and the History of Acquisition, Disposal, and Retention."
[83] Public land Statistics, 2011. Bureau of Land Management. U.S. Department of the Interior.

Yellowstone, was established in 1872 as a permanent public property, followed by Sequoia and Yosemite in 1890.[84]

Acquiring and disposing of federal lands continues to be a key public debate as land management must balance economic growth and the protection and sustainability of our ecosystem. Because the extent of federal lands and the authority to acquire and dispose of federal lands are an enduring policy question, federal lands legislation will continue to be considered by the U.S. Congress. As recent as 2009, Congress passed and President Obama signed the Omnibus Public Lands Management Act, which designated more than 2 million acres across nine states as federally protected wilderness.[85]

The U.S. land area totals nearly 2.3 billion acres. About 60 percent (1.35 billion acres) of the land in the United States is privately owned. Twelve percent of the privately owned land is urban and rural residential areas, a percentage that has continued to increase throughout U.S. history, regularly outpacing population growth. The federal government owns 29 percent (653 million acres), over a third of which is in Alaska. State and local governments own about 9 percent (198 million acres). Nearly 3 percent (66 million acres) is in trust by the Bureau of Indian Affairs. Foreign ownership accounts for about 1 percent (22 million acres) of U.S. land.[86]

[84] Congressional Research Service Report RL34267. 2007. "Federal Land Ownership: Constitutional Authority and the History of Acquisition, Disposal, and Retention."
[85] *New York Times*. 2009. "Obama Signs the Omnibus Public Lands Management Act of 2009." March 30, 2009.
[86] Nickerson, C., Ebel, R., Borchers, A., and Carriazo, F. 2011. "Major Uses of Land in the United States, 2007." Economic Research Service, U.S. Department of Agriculture, December 2011.

Homeownership through History

Throughout the history of the United States, homeownership has been synonymous with the "American Dream," and it continues to be at the core of federal housing policy. The promotion of homeownership as a social good – indispensable for securing stability and extending prosperity – through public policy is reflected in the various federal government programs and dedicated tax code.

Homeownership has traditionally been connected to basic popular aspirations for a good life, a sense of community and general welfare. The purchase of a home is usually the most important financial commitment for most Americans, with most of their wealth concentrated in a single asset – their house.

Before the 1930s, the federal government had no major involvement in housing other than promoting private land ownership through land grant programs such as the 1862 Homestead Act, by which small farmers could acquire 160 acres at no cost other than their time and labor.[87] About 214 million acres were dispensed with the granting of homesteads. The only other notable involvement was in the aftermath of World War I, when the federal government tried to deal with the housing shortage.

In the 19th century, the majority of people still lived in rural areas working on farms. Homeownership was usually tied to a farm, and was not a priority for the urban middle class. Owning a home without a farm did not make much sense, as a farm was a productive asset, while a house was seen primarily as a cost. For the most part, homeownership was not a priority for middle-class people who did not attach the same value to owning a home as their contemporaries do. Given the poor quality of urban homes, usually attractive only to workingmen (mostly new immigrants) who wanted some security when faced with irregular labor markets and uncertain income, the advantage of homeownership was not a truth that everyone held to be self-evident. For workers and small-scale urban savers, because there were considerable restrictions on access to capital and asset markets, real property in the form of houses was one of the few investment opportunities. Homeownership for those of lower incomes can be seen as an indicator of adherence to a life-cycle savings strategy.[88] Also, it was not always possible for working class people to find rental accommodations equivalent in space

[87] Anderson, G.M. and Martin, D.T. 1987. "The Public Domain and Nineteenth Century Transfer Policy." Cato Journal, Vol. 6, No. 3 (Winter 1987).

[88] Based on the idea that people make rational choices about how much they want to spend at each age, limited only by the available resources over their lifetime. By building up and running down assets, working people can provide for their retirement, and more generally, tailor their consumption patterns to their needs at different time periods, independently of their incomes at each period.

and amenities to owner-occupied properties, which could be more readily modified to house a higher number of occupants.

To reshape the housing market, developers began building housing units offering amenities such as water and indoor toilets. These advances made houses more expensive and effectively pushed the working class out of the market replacing them with a more affluent middle class that was attracted to the new housing options. The first federal census that explicitly inquired about homeownership was that of 1890, when about 48 percent of all housing units were owner-occupied. Farming was still a major determining factor for homeownership in the waning years of the 19th century. Approximately 66 percent of families living in owner-occupied houses were farm families with just 37 percent of non-farm families owning their own home.[89]

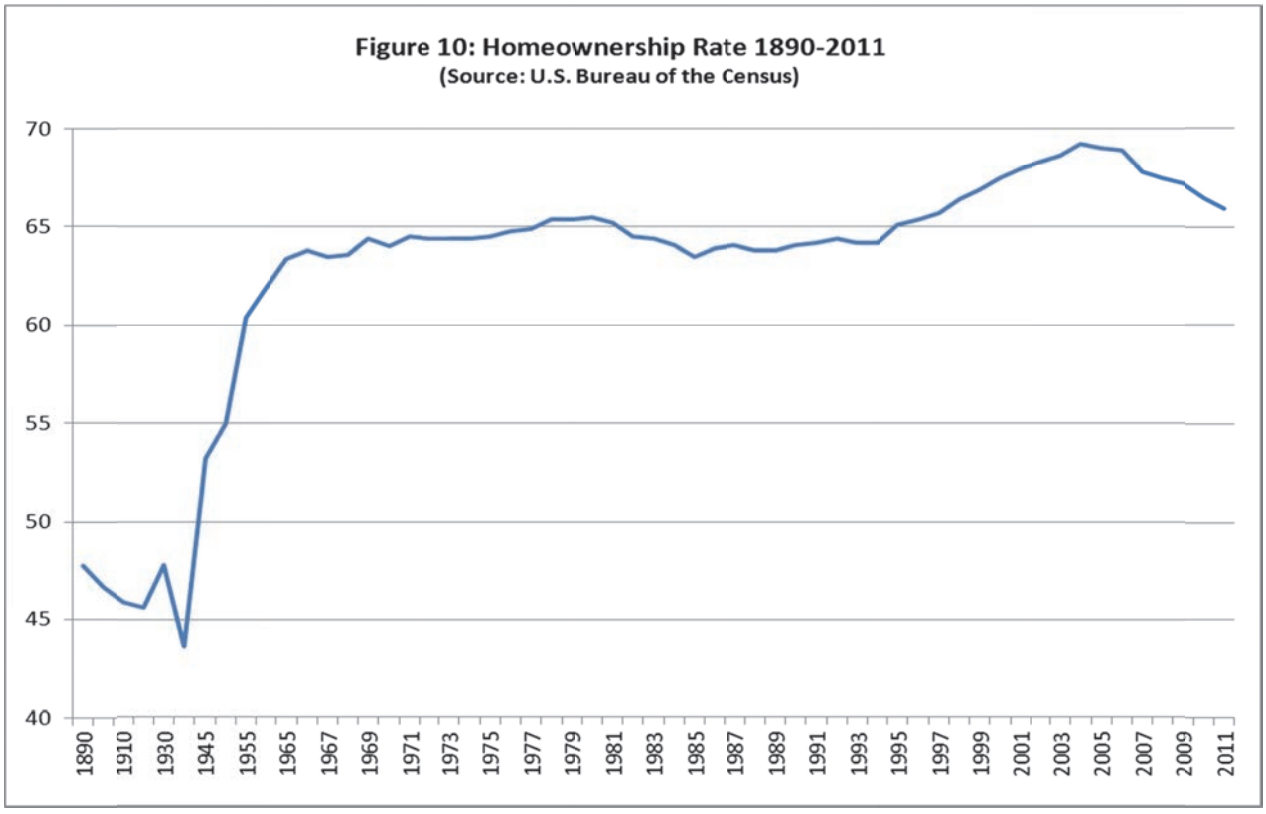
Dealing with an urban housing shortage after the end of WWI, the U.S. Department of Labor, in a partnership with the National Association of Real Estate Boards and the National Federation of Construction Industries, launched in 1918 a nationwide “Own Your Own Home" campaign.[90] In a period of radical protest and political instability, the federal government saw spreading homeownership as a means to mainstream radicalized urban workers. Also, for both the government and the industry, boosting homeownership was seen as a great way to create jobs and spur long-term economic growth. Indeed, for about 10 years, until the stock market crash of 1929 and the resulting Great Depression, a rising homeownership rate went hand in hand with a growing economy. The rate of homeownership rose from 45.6 percent in 1920 to a record high 47.8 percent by 1930. The sharp economic decline during the Great Depression years drove the homeownership rate to its lowest level at 44 percent in 1940.[91]

From the beginning of the 20th century and until the end of World War II, the national homeownership rate fluctuated within the narrow band of about 43 percent to 48 percent. The nation experienced a sharp rise in the homeownership rate in the post-war period, due to significant pent-up demand after the Great Depression and war years, incentives to purchase homes through government-supported finance mechanisms, and large amounts of new construction of modestly priced houses in suburban developments. By the late 1960s, the homeownership rate had soared to a then record level of about 64 percent[92] (Figure 10).

[89] Haines, M.R. 2011. “Homeownership and Housing Demand in Late Nineteenth Century America: Evidence from State Labor Reports.” Colgate University.
[90] Weiss, M.A. 1989. “Marketing and Financing Home Ownership: Mortgage Lending and Public Policy in the United States, 1918-1989.” *Business and Economic History,* Volume 18, 1989.
[91] U.S. Bureau of the Census. 1989. “Historical Statistics: Colonial Times to 1970.” U.S. Department of Commerce.
[92] U.S. Bureau of the Census. 1989. “Historical Statistics: Colonial Times to 1970.” U.S. Department of Commerce.

The homeownership rate continued to increase in the 1970s, supported by the dual forces of particularly positive demographics (baby boom generation) and exceptionally low and at times even negative real interest rates. The great number of first-time buyers taking advantage of the low interest rates and entering the market pushed the homeownership rate to a new record level of 65.5 percent set in 1980.

Throughout the 30-year period 1965-1995, the homeownership rate stayed remarkably stable at around 64-65 percent, with people mostly trading up to bigger and better houses. The next spike in homeownership rate was in the boom years of the late 1990s and early 2000s peaking in 2004 at an all-time record of 69.2 percent. The hot housing market, sustained by financing innovations and continued government support, lasted until the subprime mortgage crisis and subsequent bursting of the housing bubble and the foreclosures that followed. As a result, the homeownership rate fell back to the 1998 level, where it stands at 66 percent[93] as of the end of 2011 (Figure 10).



[93] U.S. Bureau of the Census. 2011. "Current Population Survey/Housing Vacancy Survey." U.S. Department of Commerce.

Evolution of Housing Finance

The first known system to finance housing in the United States was the communal Terminating Building Societies (TBS), which originated in late-18th century England and dominated house financing in the early to mid-19th century United States.[94] These building societies were the progenitors of the savings and loans (S&L) and operated by pooling local peoples' savings to provide funds for house construction in the community. Once all the members of the TBS had received loans to build their houses, the society would cease to exist, hence the term "terminating."

Most of the loans the TBS made had maturities of six to 10 years with semi-annual payments and non- or partially -amortizing principal, variable interest and a maximum 50 percent loan-to-value (LTV) ratio. In the TBS system, all the risks were completely internalized and borne by the participating members within a small community. TBS members made and enforced mortgages cooperatively. The first mortgage loan was provided in April 1831 by Oxford Provident, the first building society, and went into default.[95] The members negotiated a property transfer to a different member who was able and willing to repay the loan. Later in the century, most TBS evolved into Permanent Building Societies, and by the 1890s, there were 2,300 societies operating in the 28 largest cities of the country. Each building society averaged just about 300 members.[96]

The attempt to transform some of the communal building societies into a national system in the 1890s was short-lived. Any efficiencies that national societies might have gained by the expansion were offset by unreliable local information that led to adverse selection. The perverse incentives of national societies' local agents resulted in a high number of defaults and a lot of foreclosed, overvalued properties. Financial historians commonly date the end of the national building societies in 1896, following the failure of the largest society in the country. Most of the rest closed soon afterward, with only six out of 240 national associations surviving the century.[97]

In the 1870s, mortgage banks were formed to give loans in the expanding Midwestern and Western states. These banks, modeled after French and German banks, originated and serviced

[94] Office of Policy Development and Research. 2006. "Evolution of the U.S. Housing Finance System." U.S. Department of Housing and Urban Development.
[95] Cho, M. 2007. "180 Years' Evolution of the US Mortgage Banking System: Lessons for Emerging Mortgage Markets." *International Real Estate Review, 2007* Vol. 10 No.1: pp. 171-212.
[96] Office of Policy Development and Research. 2006. "Evolution of the U.S. Housing Finance System." U.S. Department of Housing and Urban Development.
[97] Lamoreaux, N.R. and Raff D.M.G. 1995. "Coordination and Information: Historical Perspectives on the Organization of Enterprise." National Bureau of Economic Research.

loans with funds raised by selling Mortgage Backed Bonds (MBB).[98] In this early securitization technique, known as the "farm mortgage debenture movement," the mortgage banks placed loans they made into trust accounts and issued debentures against them. Investors that purchased these securities assumed the credit risk of the issuing entity (mortgage bank) and were compensated through a premium in the interest rate. The MBBs were issued in series, normally $100,000 in size, that were secured by a pool of between 100 and 200 loans. If the issuing bank defaulted on its debenture payments, the trustee took possession of the specific pool of loans behind each series and liquidated the loans on behalf of the investors.

By constructing new securities to fund pools of mortgage loans, the mortgage banks introduced elements of modern securitization almost one hundred years earlier. Despite the similarities though, there were two fundamental differences between this early version of securitization and the modern variety.[99] The 19th century securitized debentures were direct claims against the mortgage company that originated and serviced the underlying mortgage loans and were the sole liabilities of the mortgage bank. The issuing bank had a formal commitment to absorb all of the credit risk on the mortgages that it made and serviced, as opposed to modern mortgage-backed securities that are backed by loans that no longer reside on the issuing bank's books. The credit risk, along with the loans, is thus effectively transferred off the bank's balance sheet to the securitizing entity. Additionally, the old debentures did not transform the timing, term or liquidity of the payments from the underlying mortgage loans as they just "passed through" their cash flows by providing five-year terms, semiannual coupon payments, and minimum investments equal to a small-size mortgage. The modern mortgage-backed security, in contrast, enhanced the liquidity of the underlying mortgage loan payments and often altered their timing and maturity to fit investors' needs and risk appetites.

While this financial innovation was very successful for several years, the mortgage banks went out of business during the financial crisis and deep recession of 1890s. The loose underwriting standards employed by the mortgage companies of the time produced shoddy loans and led to the inevitable high defaults that took place during the crisis, imposing significant costs to the investors.

The rising demand for houses brought new market innovations, such as the sale of subdivision lots on land contracts with down-payments as low as five percent and very affordable monthly payments. Better-capitalized lenders, such as mutual savings banks, state-chartered

[98] Office of Policy Development and Research. 2006. "Evolution of the U.S. Housing Finance System." U.S. Department of Housing and Urban Development.
[99] Snowden, K.A. 2007. "Mortgage Companies and Securitization in the Late Nineteenth Century." University of North Carolina at Greensboro

commercial banks and life insurers, entered the market to provide mortgage loans at the turn of the century. The institutional share of residential mortgage debt rose from 49.5 percent in 1896 to 66 percent in 1912. Also, the total percentage of owned homes that were mortgaged increased from 27.7 percent in 1890 to 39.7 percent in 1920.[100]

During the first two decades of the 20th century, many of the building and loan associations were increasingly controlled by builders and realtors to promote home construction, sales and financing. These associations, like builders and brokers, were dependent on commercial banks for their short-term financing needs. This dependence, though, made the loan associations very vulnerable in times of "tight money." In the credit crunch of 1918, the establishment of a liquidity reserve on which associations could draw in order to keep lending was proposed. The plan for a system of federal loan banks was modeled on the recently created Federal Reserve System and the Federal Farm Loan Banks. Although in 1919 a bill was introduced in Congress to establish such a system, it was not until the Great Depression that it finally became reality.[101]

In the "Roaring Twenties," the booming economy boosted the real estate market's fortunes tripling the total residential mortgage debt. The volume of inflation-adjusted residential debt increased from $9 billion, in nominal terms, to $30 billion from 1921 to 1929, faster than any other time during the 20th century.[102] The rapid growth of mortgage debt surpassed even the residential construction boom of the 1920s. The savings and loans (S&L)—the building and loan associations started to refer to themselves as S&Ls in an effort to modernize and update their image—mortgaged more than 4.4 million properties, totaling about $15 billion in loans during the decade. By 1929, S&Ls provided 22 percent of all mortgages in the country.[103] Commercial banks, life insurers and mutual savings banks were the other three most important institutional mortgage lenders during that period. The overconfidence of the 1920s and the easy credit policies resulted in soaring and ultimately unsustainable debt-to-equity ratios. Along with the speculative overleveraging that was observed, much of the financing in the decade consisted of second and third mortgages, short-term, balloon payments and other risky loans.

This whirlpool of speculation ended after 1929 with a severe liquidity crisis, plunging home values and a wave of defaults and foreclosures. The three key innovations in the housing finance market in the 1920s that helped bring the mortgage market to its knees in the 1930s

[100] Weiss, M.A. 1989. "Marketing and Financing Home Ownership: Mortgage Lending and Public Policy in the United States, 1918-1989." Business and Economic History, Volume 18, 1989.
[101] Weiss, M.A. 1989. "Marketing and Financing Home Ownership: Mortgage Lending and Public Policy in the United States, 1918-1989." Business and Economic History, Volume 18, 1989.
[102] Snowden, K.A. 2009, "The Anatomy of a Residential Mortgage Crisis: A Look Back to the 1930s." Presented at George Washington University Law School's conference, The *Panic of 2008*, April 3-4, 2009.
[103] Weiss, M.A. 1989. "Marketing and Financing Home Ownership: Mortgage Lending and Public Policy in the United States, 1918-1989." Business and Economic History, Volume 18, 1989.

were high leverage loans, affordability mortgage products, private mortgage insurance and a second wave of securitization.

Mortgage insurance[104] and participation certificates that were issued on mortgage collateral were brought to the market by mortgage guarantee companies. While some of the participation certificates were backed by single mortgages, others were issued against pools of insured mortgages, employing a similar "pass-through" cash flow structure as modern residential mortgage-backed securities.

Another form of securitization was used in the 1920s to finance construction of large residential projects. Developers issued single-property real estate bonds backed by future income from the sale of the properties. Although, the issuer accepted no legal liability for the payment of interest or principal, investors were protected by an explicit promise that the securities could be sold back to the issuer at a small discount.[105] A number of defaults in 1926 ended the fast growth of real estate bonds, which suffered another blow a year later when the attorney general of New York issued a warning that issuers were over-appraising properties and mismanaging trust accounts.[106]

By 1933 almost half of all mortgages had defaulted and there were about 1,000 foreclosures a day. The sharp drop in home prices (almost 50 percent) in the first couple of years into the Great Depression eroded the collateral values for loans, resulting in large-scale bank runs and generalized insolvency for the entire banking system. The New York Department of Insurance seized a number of mortgage guarantee companies for liquidation. A total of $1 billion in insured mortgages and $800 million in participation certificates were issued by these companies and were held by more than 200,000 investors. Regulators found that the default rate among mortgages in collateral pools (backing participation certificates) was much higher than other mortgages. In the investigation of the mortgage guarantee industry that followed, it was found that companies had violated underwriting standards, substituted bad loans for performing loans in collateral pools, and had inadequate capital to support their insurance policies.[107] Private mortgage insurance did not come back until the 1950s in a much different regulatory environment.

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[104] Private mortgage insurance first became available in New York in the beginning of the 20th century when title insurers were allowed to also write policies on mortgage payments.

[105] Snowden, K.A. 2009. "The Anatomy of a Residential Mortgage Crisis: A Look Back to the 1930s." Presented at George Washington University Law School's conference, The Panic of 2008, April 3-4, 2009.

[106] Gray, J. H. and Terbough G. W. 1929, "First Mortgages in Urban Real Estate." *The Brookings Institute Pamphlet Series.*

[107] Snowden, K.A. 2009. "The Anatomy of a Residential Mortgage Crisis: A Look Back to the 1930s." Presented at George Washington University Law School's conference, The Panic of 2008, April 3-4, 2009.

By 1935, 80 percent of all outstanding real estate bonds had defaulted, with an average recovery value of about 50 percent of face value. The mass defaults and reforming legislation during the 1930s, led to the disappearance of this form of securitization.[108]

As the banking crisis worsened and the Depression deepened, intervention by the federal government presented the only viable and realistic solution, although many financial institution executives favored short-term help to save them from insolvency and not a major overhaul of the financial system that would produce dramatic and long-term changes in private lending practices.

The federal government, facing a systemic crisis of historic proportions, instituted a number of dramatic structural changes. Following the establishment of the Federal Home Loan Bank System to reorganize the insolvent S&Ls and provide them with liquidity, the government created the Home Owners' Loan Corporation (HOLC) in 1933 and the Federal Housing Administration (FHA) in 1934.[109] The HOLC, in three years, refinanced more than $3 billion of defaulted or troubled mortgage loans, held mostly by commercial banks. It also introduced and popularized one–to five-year self-amortizing loans.[110] The HOLC stopped lending in 1936 once all the available capital had been allocated, and it began the process of liquidating its assets. While the HOLC's work was considered successful in curtailing systemic risk, the problem of moral hazard emerged as a byproduct, as it became obvious that a significant number of borrowers purposely defaulted on their existing mortgage loans to take advantage of the government bailout program.

The FHA was not intended to be a short-lived operation like the HOLC, but was a central tool in the plan to revolutionize housing finance under the New Deal (the federal economic plan to respond to the Great Depression). The mutual mortgage insurance system of the FHA helped reduce the investment risk for lenders (by providing insurance against defaults) and allowed them to make longer-term (20 or more years), low down-payment, self-amortizing loans at lower fixed interest rates. The National Housing Act of 1934, which created the FHA, also authorized the establishment of national mortgage associations to issue bonds and purchase mortgages from primary market lenders.[111] The aim was to expand the institutional base for

[108] Snowden, K.A. 2009. "The Anatomy of a Residential Mortgage Crisis: A Look Back to the 1930s." Presented at George Washington University Law School's conference, The Panic of 2008, April 3-4, 2009.
[109] Office of Policy Development and Research. 2006. "Evolution of the U.S. Housing Finance System." U.S. Department of Housing and Urban Development.
[110] Hillier, A. 2003. "Who Received Loans? Home Owners' Loan Corporation Lending and Discrimination in Philadelphia in the 1930's." *Journal of Planning History*, Volume 2, Issue 1, 2003, pages 3-24.
[111] Cho, M. 2007. "180 Years' Evolution of the US Mortgage Banking System: Lessons for Emerging Mortgage Markets." International Real Estate Review, 2007 Vol. 10 No.1: pp. 171-212.

mortgage funding by motivating institutions, such as commercial banks to re-enter the mortgage market.

In order to help stabilize and support the restructuring of the banking system, two deposit insurance companies—the Federal Deposit Insurance Corporation (FDIC) for commercial banks and the Federal Savings and Loan Insurance Corporation (FSLIC)—were created. The FSLIC was founded partly to reward S&Ls for withdrawing their objections to the establishment of the FHA and to establish a level playing field (for banks and S&Ls) to compete for funds.[112]

The first mortgage association authorized by the FHA, the Federal National Mortgage Association (FNMA, now known as just Fannie Mae), was established in 1938 as a government-owned agency to provide a secondary market for FHA-insured mortgage loans. Fannie Mae was also expected to smooth out credit allocation by borrowing in areas where credit was plentiful and lending where it was scarce, as there were significant geographic differences in the availability of funds.

After the end of World War II, in order to assist returning veterans and boost local economies where credit was in short supply, the Veterans Administration (VA) home loan guarantee program was introduced as part of the Servicemen's Readjustment Act of 1944 (known informally as the G.I. Bill). Under the VA program, an eligible veteran could buy a house with often no down payment at all.

The FHA was highly successful in the 1940s and 1950s and, together with Fannie Mae, contributed greatly to the rapid growth of the mortgage market. Mortgage banks originated a huge volume of FHA/VA loans, which they sold to Fannie Mae, while continuing to earn substantial income from servicing fees. The Housing Act of 1954 expanded Fannie Mae's charter, directing the agency to provide liquidity in the mortgage market in addition to managing its existing mortgage loan portfolio. Fannie Mae was reorganized as a mixed ownership corporation with the federal government and lenders who sold mortgages as the shareholders. During that period, the FHA's success produced two unintentional but transformational effects for the mortgage industry. First, S&Ls found it profitable to sell long-term, self-amortizing conventional mortgage loans without government insurance, and second, private institutions in the mid-1950s saw profit opportunities in writing mortgage insurance. After 1957, with every state passing legislation allowing private mortgage insurance, the FHA's monopoly was effectively over.

[112] Office of Policy Development and Research. 2006. "Evolution of the U.S. Housing Finance System." U.S. Department of Housing and Urban Development.

In the mid-1960s, rising inflation and interest rates presented serious challenges to the housing finance system. Savings and Loans' reliance on short-term deposits to fund long-term fixed rate mortgages put a serious squeeze on their profit margin. Rising interest rates pushed higher the rates paid on deposits, while returns on mortgages remained fixed. At the same time, the origination of new mortgages slowed significantly as high interest rates weakened housing demand. Also, S&Ls suffered from a worsening duration mismatch due to the rising interest rates, as the effective maturity of their existing loans lengthened when prepayments slowed down in the new higher interest rate environment. If that wasn't enough, S&Ls experienced a substantial deposit drain when savers turned to money market mutual funds (which came into existence in the early 1970s) seeking higher interest rates. While rates on bank and S&L deposits were limited by Regulation Q,[113] money market funds could offer higher rates to savers. Between 1977 and 1981, the assets of money market funds soared from $3.5 billion to $180 billion. The market share of residential mortgages of S&Ls dropped from 53 percent in 1975 to 30 percent in 1986, contributing to the wave of mass failures in the late 1980s (known as the S&L crisis).[114]

Responding to the challenges to the mortgage market and in an effort to strengthen the industry, the federal government phased out Regulation Q; allowed S&Ls to issue new products on both the asset side (adjustable rate mortgages) and the liability side (money market deposit accounts); privatized Fannie Mae (1968) allowing it to buy conventional (not government-insured) loans; and established the Government National Mortgage Association (commonly known as Ginnie Mae) (1968) to securitize FHA and VA loans and Freddie Mac (1970) to boost liquidity for S&Ls by developing a secondary market for conventional mortgage loans under the Federal Home Loan Bank Board.[115]

As with Fannie Mae, Freddie Mac (founded as Federal Home Loan Mortgage Corporation) was established as a shareholder-owned corporation with government sponsorship. However, the two agencies did not enjoy the benefit of the full faith and credit of the U.S. government and carried no explicit government guarantees. The capital markets, though, generally viewed Fannie Mae and Freddie Mac bonds as having an implicit government guarantee,[116] which would allow the federal government to provide additional funds to the GSE-conforming

[113] Regulation Q was a Federal Reserve Board regulation that put limits on the interest rate that banks could pay on savings deposits. It also prohibited the payment of interest on demand deposits by member banks of the Federal Reserve System.

[114] Office of Policy Development and Research. 2006. "Evolution of the U.S. Housing Finance System." U.S. Department of Housing and Urban Development.

[115] DiVenti, T.R. 2009. "Fannie Mae and Freddie Mac: Past, Present, and Future." *Cityscape: A Journal of Policy Development and Research,* Volume 11, Number 3, 2009.

[116] This guarantee was actually activated during the financial crisis in 2008 when both government-sponsored enterprises (GSE) were placed into conservatorship under the auspices of the U.S. government.

mortgage market without needing an annual appropriation.[117] Ginnie Mae, as a wholly owned government corporation, has a different charter, as it was mandated to issue mortgage-backed securities (MBS) supported by FHA and VA mortgage loans and to further guarantee the timely payment of interest and principal on any loans used to support a Ginnie Mae MBS.

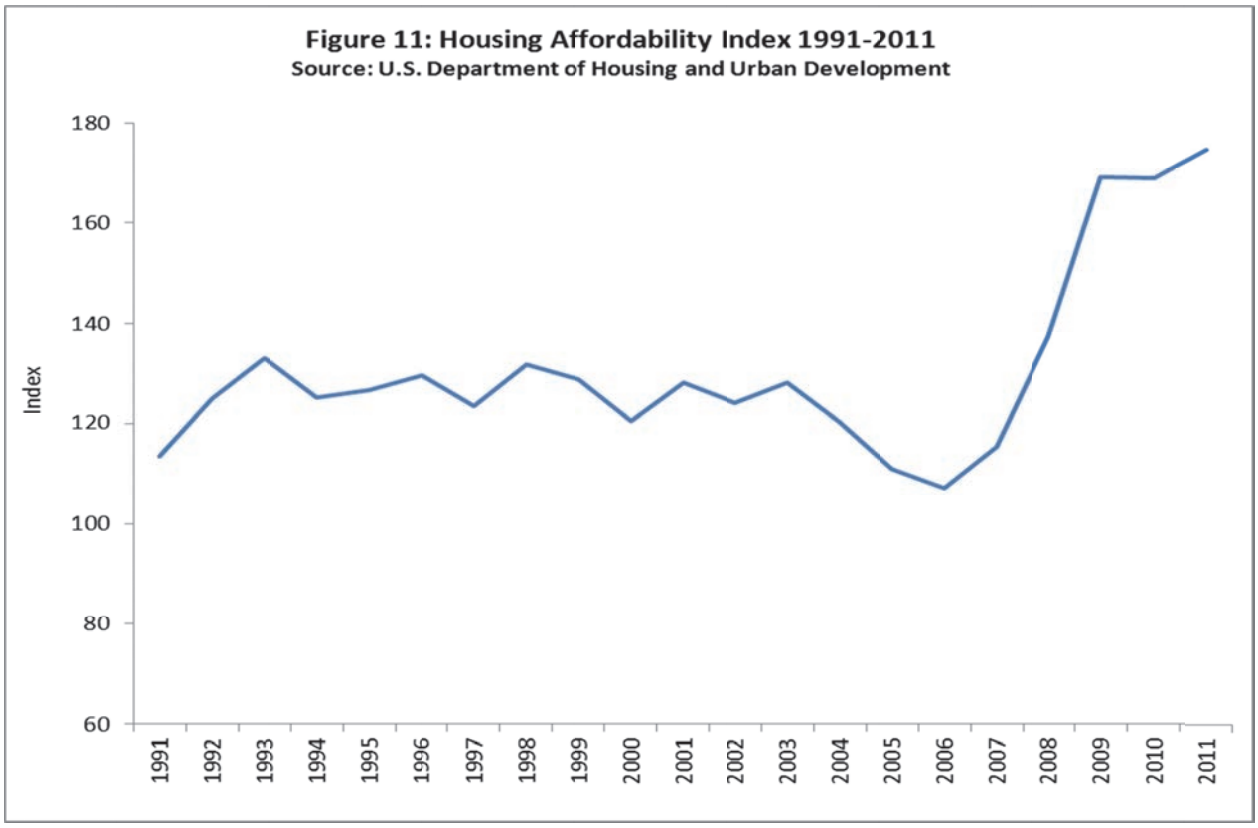
The Financial Institutions Reform, Recovery, and Enforcement Act of 1989 dissolved the Federal Home Loan Bank Board and established a shareholder-elected board of directors for Freddie Mac. Freddie Mac mostly securitized mortgages until the early 1990s, when it started amassing a substantial portfolio of mortgages. In 1992, the Federal Housing Enterprises Financial Safety and Soundness Act revised Fannie Mae and Freddie Mac's regulatory oversight structure, creating the Office of Federal Housing Enterprise Oversight (OFHEO) to monitor the solvency and soundness of the two GSEs. The Act also set housing goals for Fannie Mae and Freddie Mac, with a specific focus on low income and underserved housing areas.[118] In 1995, the U.S. Department of Housing and Urban Development (HUD), in order to meet the affordable housing goals, started requiring the GSEs to purchase mortgages made to low- and moderate-income families and mortgages on properties located in underserved and/or low-income areas.

Starting in 2006, as their combined share of mortgage originations declined (from 70 percent in 2003 to 40 percent in 2006), Fannie Mae and Freddie Mac expanded their purchases to include riskier non-traditional "affordability" loans (designed to minimize down-payments, initial monthly payments, or both). The GSEs, which had begun slowly increasing their exposure to nonprime (subprime and Alt-A) mortgages in 2000—Fannie Mae and Freddie Mac purchased $600 million and almost $19 billion respectively—ratcheted up their involvement in that market while investing in non-agency MBS (issued by private entities). In the end of 2008, the GSEs held approximately $238 billion in non-agency mortgage securitizations, exposing them to significant losses as the value of these securities plummeted in many cases as much as 90 percent from the time of purchase.[119] By 2009, the GSEs held about 44 percent of the total outstanding mortgage debt in the country, with combined obligations of more than $5 trillion.[120]

Despite government agencies' otherwise laudable goals for the provision of affordable housing and the plethora of financing options available, home prices kept going up as high-risk loans

[117] Each GSE enjoyed an open line of credit with the U.S. Department of the Treasury of $2.25 billion.
[118] Congressional Budget Office. 2010. "Fannie Mae, Freddie Mac, and the Federal Role in the Secondary Mortgage Market." The Congress of the United States.
[119] DiVenti, T.R. 2009. "Fannie Mae and Freddie Mac: Past, Present, and Future." Cityscape: A Journal of Policy Development and Research, Volume 11, Number 3, 2009.
[120] Federal Housing Finance Agency. 2010. *Enterprise Share of Residential Mortgage Debt Outstanding 1990 – 2010.*

were becoming widely accessible, feeding the demand for houses. As the growing demand was pushing against an ever-rising supply of houses (the number of new privately owned homes completed reached a historical high in 2006), homes were becoming less affordable. As a result, the housing affordability index, as calculated by HUD, reached in 2006 its lowest point since the late 1980s (Figure 11).



When the housing crisis erupted, the risks that the GSEs had taken during the boom years were exposed, causing huge losses on the guarantee and portfolio business, and triggering insolvency concerns. In September 2008, both Fannie Mae and Freddie Mac entered into a conservatorship under the Federal Housing Finance Agency (FHFA). The Treasury Department in order to restore the agencies' solvency, acquired $1 billion in senior preferred stock in Freddie Mac and Fannie Mae and warrants for the purchase of common stock, representing nearly 80 percent of outstanding common stock. Furthermore, in order to safeguard the GSEs' viability and stability, the Treasury Department and Federal Reserve launched the Troubled Asset Relief Program (TARP) and Term Asset-Backed Securities Loan Facility (TALF) to buy GSE MBS and direct obligations. By 2009, the Treasury Department had spent close to $60 billion on capital injections through its acquisition of GSE preferred stock and the Federal Reserve had bought approximately $77 billion in GSE debt. Additionally, both the Fed and the Treasury purchased

about $567 billion in agency MBS.[121] Through federal conservatorship, the GSEs were able to maintain, and even increase, their presence in the secondary mortgage market. At the end of 2008, their combined share of single-family mortgage purchases was around 73 percent for 2008 as a whole. GSEs were also at the core of the government's efforts to control delinquencies with the Home Affordable Modification Program (HAMP) and Home Affordable Refinance Program (HARP).[122]

According to a report to U.S. Congress by the Treasury and HUD, the GSEs' affordability goals did not play a significant role in their failure. Rather, the report points to poor underwriting standards, the underpricing of risk, and insufficient capital with inadequate regulatory or investor oversight as the main reasons for the problems Fannie Mae and Freddie Mac confronted.[123] Interestingly, the GSEs suffered from the same weaknesses and errors in judgment as the private-label issuers. In fact, delinquency rates on many private-label securities and other mortgages held by banks and other private market institutions were significantly higher than on the loans held by both GSEs combined, including loans qualifying for the affordability goals. Thus, although, by many measures, the GSEs' affordability goals were poorly designed and did not ultimately help the targeted lower-income communities as envisioned, Fannie Mae's and Freddie Mac's predicament can be mainly attributed to their operational flows, inadequate risk management and poor decision-making.[124]

[121] DiVenti, T.R. 2009. "Fannie Mae and Freddie Mac: Past, Present, and Future." Cityscape: A Journal of Policy Development and Research, Volume 11, Number 3, 2009.
[122] Stevens, D. 2009. "Progress of the Making Home Affordable Program: What Are the Outcomes for Homeowners and What Are the Obstacles to Success?" Commissioner U.S. Department of Housing and Urban Development.
[123] U.S. Department of the Treasury and U.S. Department of Housing and Urban Development. 2011. "Reforming America's Housing Finance Market." *Report to Congress*, February 2011.
[124] U.S. Department of the Treasury and U.S. Department of Housing and Urban Development. 2011. "Reforming America's Housing Finance Market." Report to Congress, February 2011.

The Modern Age of Securitization

The modern age of securitization started with the federal government's plan to create an efficient government-guaranteed secondary market instrument, effectively linking the housing market with the capital markets, in order to expand affordable housing. The securitization technique involves the issuance of a debt instrument backed by underlying revenue-generating assets (e.g., mortgage loans) that are pooled together by the issuer for that purpose. Although the age of securitization was kick-started with residential mortgage-backed securities (RMBS), in theory, any asset that can produce a revenue stream can be transformed (i.e., securitized) into a tradable debt instrument and marketed to investors. Investors who would buy an RMBS would receive a share of the monthly payments made by the homeowners along with principal from the underlying loans.

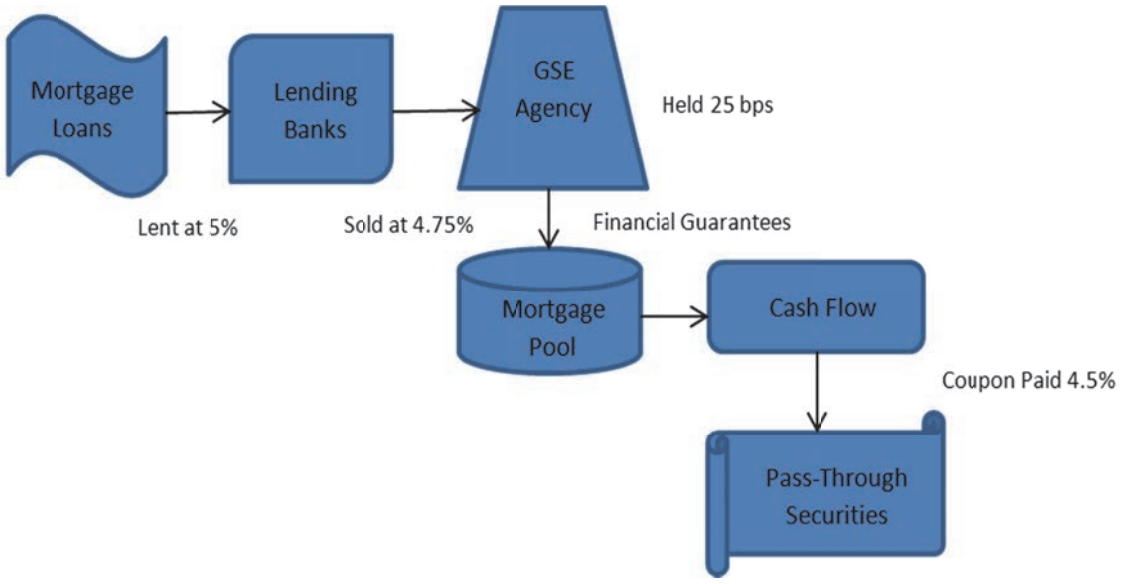
The purpose of residential mortgage securitization is to facilitate the flow of capital from a wide investor base into the mortgage credit market, increasing the availability of credit to homebuyers while reducing the cost. Since its early days, securitization has provided the financing for the vast majority of mortgages in the country.

The first RMBS offering by Ginnie Mae was in 1970 with a face value of $70 million.[125] The mortgages backing this security were originated by mortgage bankers who, following the issuance of the RMBS, continued to service the loans. While Ginnie Mae guaranteed the mortgage-backed securities, they were issued by private institutions approved by Ginnie Mae. Abstracting from later innovations and added layers of complexity, this particular RMBS model (originator, issuer, guarantor/insurer, seller, servicer and investor) has remained mostly intact through the present time and has served as the basis of all the securitization technology that has followed since.

The pass-through securities are the archetypical RMBS created by putting together a number (ranging from a handful to several thousand) of mortgage loans to form a pool (collection) of similar assets. The pass-through RMBS constitutes a single-class security (one class of bondholders) with repayment coming from the cash flow of the underlying pool of assets (Figure 12). While investors' claims on the cash flow represent ownership of the assets, the legal title to the properties is held by a trust (a GSE in the case of agency RMBS) which is a separate legal entity from the originators. Pass-through securities have the same type of assets backing them (assuming no guarantees or other credit enhancements) as well as interest rate risk and prepayment risk.

[125] McConnell, J.J. and Buser, S. A. 2011. "The Origins and Evolution of the Market for Mortgage-Backed Securities." *Annual Review of Financial Economics,* Vol. 3.

Figure 12: Basic Pass-Through MBS

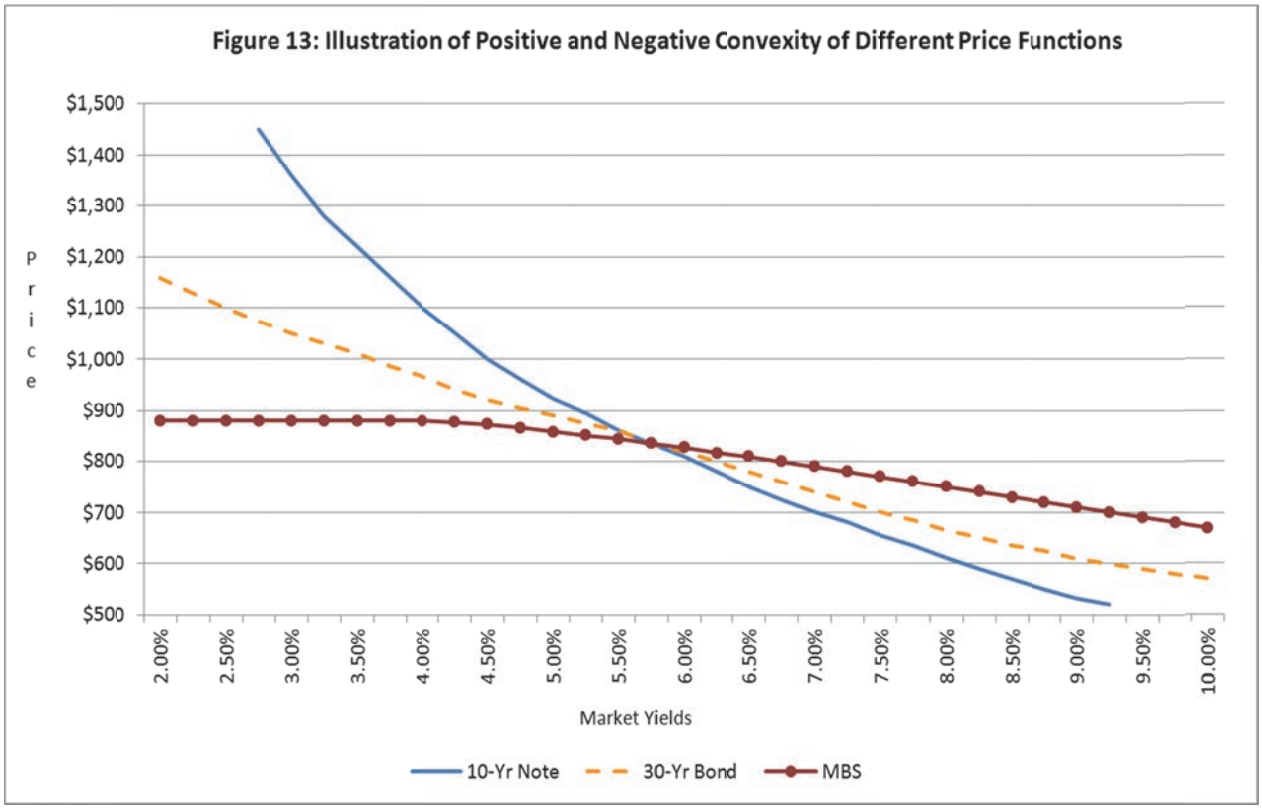


Freddie Mac and Fannie Mae brought their first RMBS to the market in 1971 and 1981, respectively.[126] Just like the earlier Ginnie Mae issues, these securities were also simple pass-through deals representing direct ownership interest in a pool of mortgages. Monthly payments of interest and principal made by borrowers were collected and then "passed through" to investors on a pro-rata basis. The servicer (the bank that issued the mortgage) kept a portion of the interest component of each monthly payment as the "servicing fee" (Figure 12). The pass-through rate investors received was the mortgage rate net of the servicing fee rate. All agency RMBS (Ginnie Mae, Freddie Mac and Fannie Mae) carried guarantees on payment of both interest and principal, which protected investors from credit risk on loans. The presence of explicit or implicit government insurance helped eliminate credit risk and negate the need for any additional credit enhancements.

Interest rate risk and prepayment risk are the two sides of the same risk faced by an RMBS investor, and both are a function of interest rate movement. For example, if interest rates fall, the borrower has the option to prepay the mortgage loan and refinance to take advantage of the lower market rates. Prepayment risk is what gives MBS their negative convexity, in contrast with other fixed-income securities that display positive convexity (Figure 13). RMBS' negative convexity results from the declining rate of price changes (prices adjust upward slower and by a shrinking percentage to downward yield changes) as the interest rates drop until prices

[126] McConnell, J.J. and Buser, S. A. 2011. "The Origins and Evolution of the Market for Mortgage-Backed Securities." Annual Review of Financial Economics, Vol. 3.

basically flatline at very low interest rate levels due to the presence of prepayment risk (Figure 13). On the other hand, interest rate risk is manifested through the declining value of a security when interest rates rise. The percentage change in a security's price as a result of a percentage point change in its yield is reflected in the steepness of the curve of the price function, and it is called the duration of the security (Figure 13). Convexity shows how the duration of a security changes in response to movements in interest rates (yields).



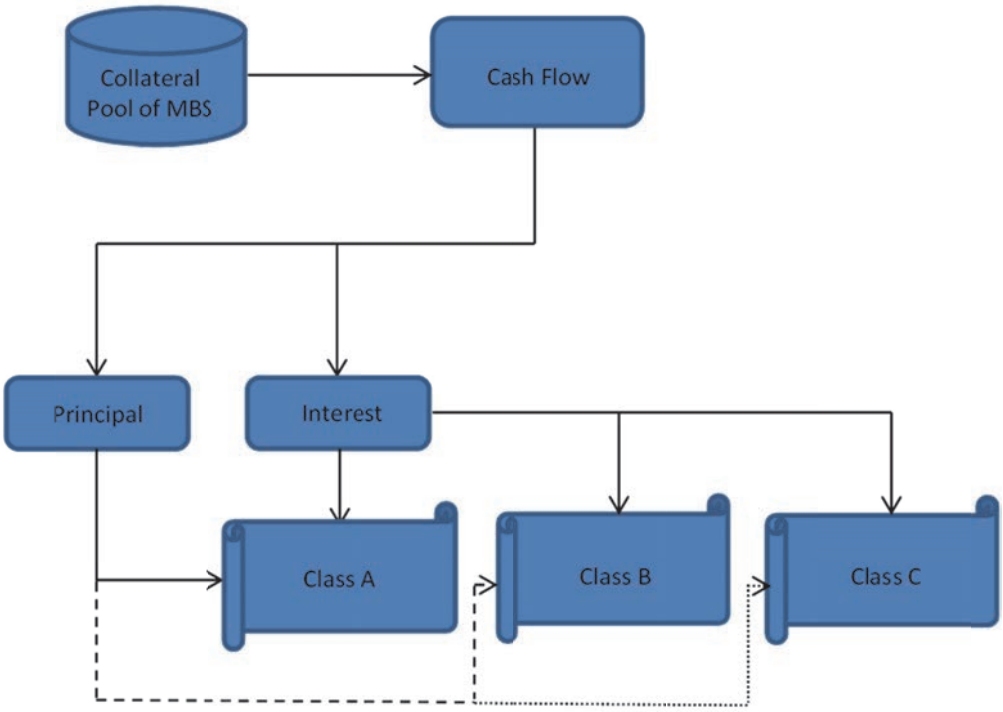
The increasing popularity of RMBS attracted a new class of investors who demanded a mortgage-backed investment product more tailored to their needs. A novel pay-through structure was devised to provide more investment choices by overcoming some of the disadvantages of the simpler pass-through RMBS, such as the uncertain maturity and cash flow due to prepayment risk and the unavoidable interest rate risk. The more complex securities, known as collateralized mortgage obligations (CMOs) provided enough customization to match maturities, and levels of risk with specific needs of different investors.

The first CMO was issued in 1983 by Freddie Mac, using a pool of pass-through securities as collateral.[127] Unlike the single-class pass-through RMBS, CMOs are multiclass securities with

[127] McConnell, J.J. and Buser, S. A. 2011. "The Origins and Evolution of the Market for Mortgage-Backed Securities." Annual Review of Financial Economics, Vol. 3.

each class (or tranche, as it is often called), offering different principal amounts, coupon rates, prepayment risks, and average maturity dates (ranging from a few months to more than 20 years). Payments from the underlying RMBS and/or mortgage loans (most CMOs' collaterals consist of just RMBS) in the collateral pool are distributed to the tranches following a set of predetermined rules with tranches retiring (maturing) sequentially[128]. The coupon rate of interest is directed to all the tranches, while the principal payments are paid first to the bond class with the shortest maturity (Figure 14). When the first CMO tranche is retired, the principal payments are directed to the bond class with the next shortest maturity, with the process continuing until all the tranches have received their scheduled principal and interest payments and have matured (Figure 14).

Figure 14: Pay-Through MBS (CMO) Structure



Due to the presence of some interest rate risk in CMOs (since ultimately the mortgages supporting the payments are fixed-rate loans) floating rate tranches were introduced to reduce

[128] In addition to the traditional sequential pay agency CMO, a variety of other more complex agency CMO structures exist such as PAC (planned amortization class) CMOs which offer more cash flow certainty by smoothing out irregularities due to prepayments.

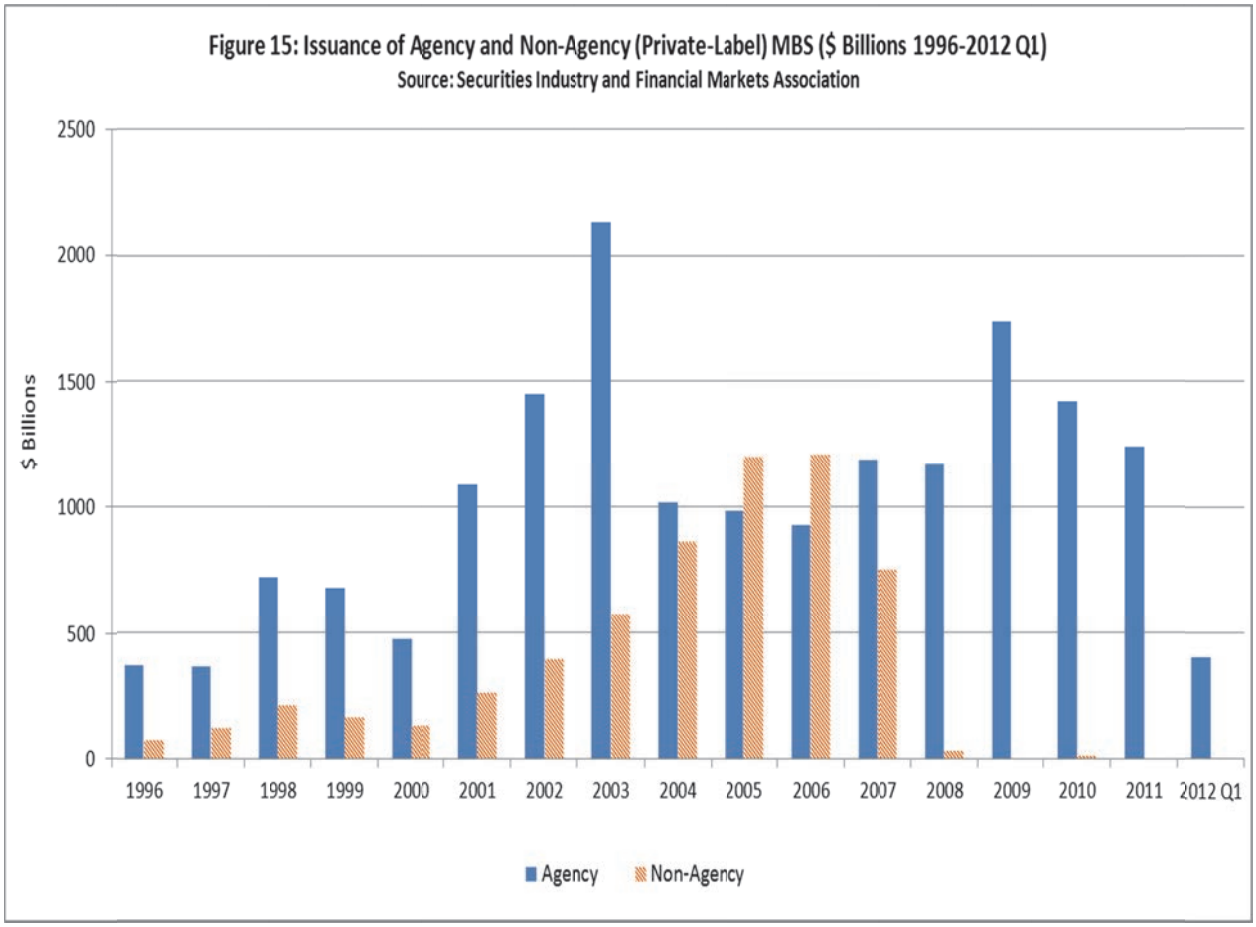
that risk even further. Interest-only and principal-only CMOs were also created, giving investors the choice to receive just interest or principal from the underlying securities.

The first private-label or non-agency RMBS was issued in 1977 by Bank of America, but it was not until the mid-1980s that the private label market had a meaningful share of the MBS total issuance volume.[129] The growth of the private-label RMBS market was facilitated by the passage of the Secondary Mortgage Market Enhancement Act (SMMEA) of 1984, which permitted nationally recognized statistical rating organizations (NRSROs) (e.g., Moody's and Standard & Poor's) to rate mortgage pools that could then back private RMBS. The act overrode state legal restrictions on private-label investment, making all private RMBS eligible, provided they were rated in one of the two highest rating categories by at least one NRSRO. The Federal Reserve Board also greatly helped boost the issuance of private-label RMBS in the 1980s by treating private pass-through securities in the same fashion as agency pass-through securities, by allowing private-label RMBS to be used as collateral for margin transactions by brokers and dealers.

Although private-label market share broke through the 10 percent barrier in the mid-1990s, it was in 2003 that it actually began to soar to levels that challenged the agency RMBS for market dominance[130] (Figure 15). The rapid growth of non-agency RMBS coincided with the housing boom and the concurrent dramatic shift in the mix of mortgage products toward non-conforming loans that did not meet the agencies' criteria (including limits on maximum loan amount, loan-to-value ratio, debt-to-income ratio and documentation requirements).

[129] Office of Policy Development and Research. 2006. "Evolution of the U.S. Housing Finance System." U.S. Department of Housing and Urban Development.

[130] Levitin, A.J. and Wachter, S.M. 2010. "Explaining the Housing Bubble." Institute for Law & Economics Research Paper No. 10-15, University of Pennsylvania Law School.



As opposed to the GSEs that could only purchase loans that conformed to their underwriting guidelines, there were no such restrictions for the banks and mortgage bankers that served as private-label conduits. Thus, private-label securitization played a key role in forming a growing market for nonprime, nonconforming mortgage loans that eventually helped fuel the housing boom.

Initially, private-label securitizations were limited to jumbo mortgage loans, which were essentially prime conventional mortgages whose total amount exceeded the established maximum for conforming GSE loans. Although, prime jumbo loans did not carry any guarantees, their credit risk was mitigated by low loan-to-value and private mortgage insurance. Furthermore, only high quality jumbo loans were securitized at the behest of investors and credit rating agencies.[131] Private-label RMBS needed to achieve high investment-grade ratings in order to appeal to institutional investors, who tend to operate within strict regulatory guidelines regarding the credit quality of their investments.

[131] Levitin, A.J. and Wachter, S.M. 2010. "Explaining the Housing Bubble." Institute for Law & Economics Research Paper No. 10-15, University of Pennsylvania Law School.

By the early 2000s, the private-label securitization had begun to move into subprime loans (made to borrowers with credit scores below a certain cutoff), Alt-A (made to borrowers with near-prime credit scores and/or loans requiring little or no income documentation or that allow high debt-to-income ratios), and non-traditional mortgage loans (such as interest-only and payment-option), which experienced a meteoric rise after 2003 until the collapse of the housing market. This surge in the non-prime mortgage market followed the wave of prime refinancing from 2001 to 2003, which provided mortgage originators and RMBS issuers with a steady stream of healthy profits.[132] When refinancing subsided with the rising interest rates, the mortgage industry was compelled to find alternatives in order to maintain the high origination levels and the associated profitability. The solution was found in lowering underwriting standards to extend borrowing to hitherto marginalized borrowers.

The declining credit quality of the collateral of non-agency securitizations necessitated greater credit enhancements, both internal to the structure of the security and external in the form of pool-level private mortgage insurance and bond level financial guarantees provided by specialty bond insurers. Credit enhancements were critical for the marketability of nonprime RMBS, which in turn was directly dependent on the quality of the credit ratings.

Internal structural credit enhancements included deeper subordination to support the AAA rating of the most senior tranche (cash flows are directed to tranches based on seniority, with losses impacting first all the subordinated tranches), overcollateralization (initial principal balance of the mortgages supporting the MBS is greater than the principal balance on the MBS), excess spread (the difference between the payments received on the underlying loan collateral and the coupon on the issued security which allows coupon payments to continue being paid even in the event of loan defaults), shifting interest (the reallocation of subordinate tranches' share of prepayments to senior tranches), and reserve accounts (segregated trust accounts to cover losses caused by defaults on the underlying mortgage loans).

Financial guarantee insurance companies (known also as monolines, as their sole line of business was bond insurance) grew by mainly insuring municipal bonds (insurance consisted of a guarantee of the payments to investors). Operating in a market where defaults were historically very limited allowed the financial guarantors to operate with relatively thin capital bases. Following the same business model, the financial guarantee industry was successful in becoming an indispensable player in the nonprime mortgage securitization market and the

[132] Levitin, A.J. and Wachter, S.M. 2010. "Explaining the Housing Bubble." Institute for Law & Economics Research Paper No. 10-15, University of Pennsylvania Law School.

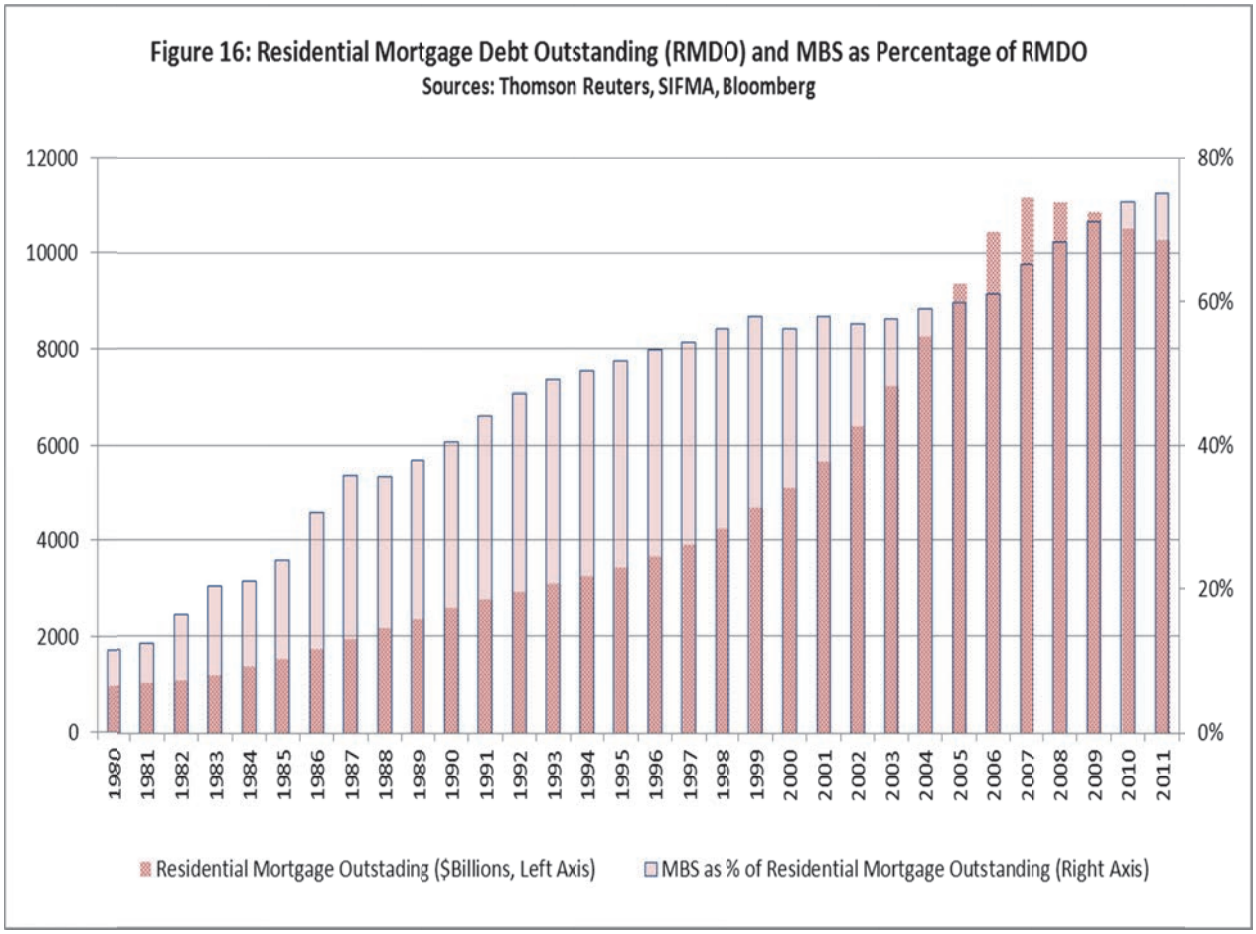
asset-backed market in general, making these securities not only accessible but also attractive to a broader investor base.

The guarantors' business model is to guarantee payment of interest and principal to investors in the event that the issuer of the guaranteed (wrapped) RMBS cannot meet its financial obligations. By guaranteeing payment, financial guarantors effectively assume all credit risk, essentially transferring their credit rating to the RMBS issuer. Consequently, maintaining a AAA credit rating is paramount to guarantors' business model. Indeed, before the subprime crisis engulfed them, most financial guarantors enjoyed the highest AAA credit rating by the three major national rating organizations (Moody's, Standard & Poor's and Fitch Ratings).

Without the private-label securitization market and the demand for its products, the majority of subprime and other non-traditional mortgages would never have been originated. Most banks would not only have been unwilling but also unable to carry that much risk on their balance sheets. The shift of the banking business model from "buy and hold"—in which banks keep loans as assets on their balance sheets—to "originate and distribute"—under which lending risks are passed to investors in the form of securitized products—dramatically altered the distribution and extent of financial risks.

This process was directly facilitated by amendments to the 1933 Glass–Steagall Act in 1999, which eliminated the segmentation of the U.S. financial system and allowed commercial banks to operate directly in the origination and securitization of mortgages. Increasingly, risks were not always accumulated by those who could best handle them as the success of the market depended on its continuous growth sustained by a steady supply of ample market liquidity.

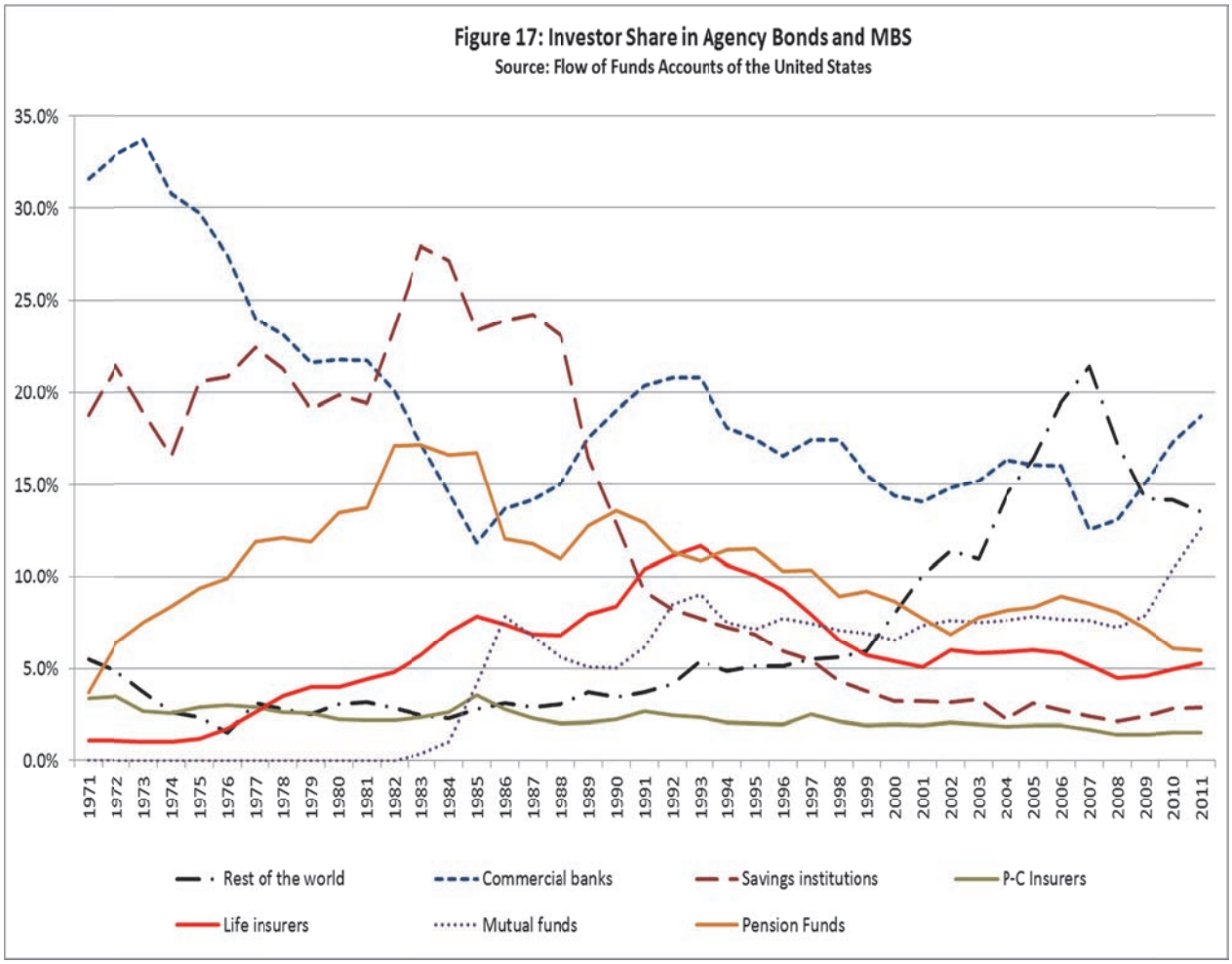
The increasing amounts of liquidity injected into the U.S. housing finance system since the 1980s was a direct result of the global acceptance of agency bonds and RMBS (including non-agency RMBS at the peak of the market). As shown in figure 16, the residential mortgage outstanding jumped more than 500 percent in the 20-year period between 1985 and 2005 registering a 10 percent constant annual growth. In the same period, the level of securitization soared 1,400 percent with over 15 percent constant annual growth.



The continuous expansion of RMBS issuance advanced the process of integration of the mortgage market with capital markets and changed and broadened the institutional base for mortgage funding. For example, more than half of all agency RMBS in the early 1970s were held by savings institutions (S&Ls) and commercial banks. By the mid-1980s, pension funds had become the second-largest RMBS investor, and following the S&L collapse in the mid- 1990s, pension funds, mutual funds and life insurers held about one-third of all agency RMBS (Figure 17). Later, during the housing and credit boom years, international investors emerged as the largest holders of agency RMBS, as foreign holdings of U.S. securities grew primarily as a result of the large U.S. trade deficits with the rest of the world (Figure 17).

The risk-based capital regulation in 1989 (Basel I) also increased the demand for RMBS, as it offered banks a capital incentive to invest in them. With lower risk weights of 20 percent for Fannie Mae and Freddie Mac RMBS and 50 percent for individual residential mortgage whole loans, investors were allowed to increase their leverage two, three and often four times, which made mortgages one of the most profitable asset types. Another factor that motivated international investors to buy U.S. debt was reductions in longer-term interest rates in places

like Europe, which undoubtedly generated interest in assets such as U.S. RMBS that offered slightly higher returns while still being considered quite safe (highly rated) and very liquid.



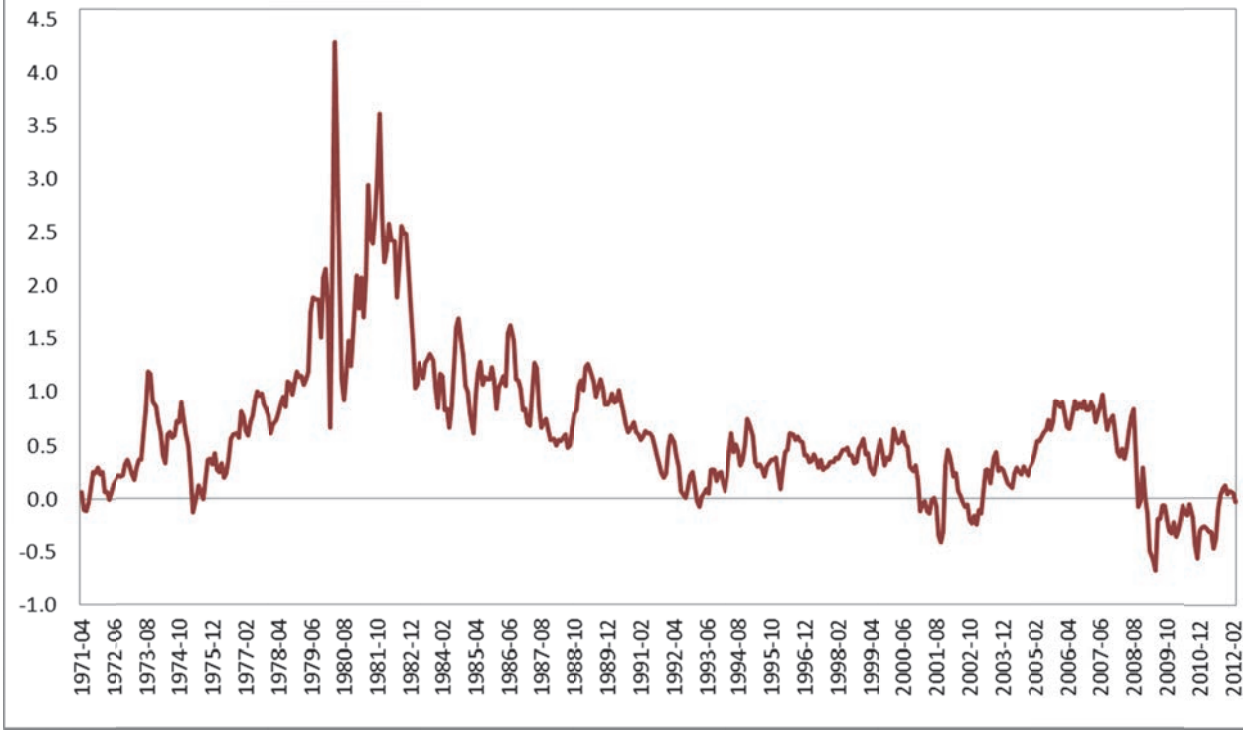
The full integration of the maturing mortgage market into the broader capital markets by the mid-2000s is evidenced by the increased efficiency of the housing finance system as it is revealed by charting the long-term historical trend of the yield spread between the relative cost of residential mortgages (the measure used here is the 30-year fixed mortgage) and corporate bonds (Moody's-rated AAA corporate bond is used as the measure) (Figure 18). The spread traces the mortgage lending sector's improvement in intermediation efficiency relative to the corporate fixed income sector.

Following the large peaks of the volatile periods in high inflation of the late 1970s and early 1980s, a stabilization trend is visible in the 1990s that continues to the present, despite some observed fluctuation during the peak of the housing boom (rising spread) and the adjustment of the post-crisis period. The gap in the spread before the 1990s may also be due to the less

liquid nature of the mortgage sector in the early years of securitization. The reduction in the liquidity premium in mortgage lending due to the wide acceptance of mortgage-related securities greatly contributed to the increased efficiency in mortgage lending intermediation.

The widening spread in the mid-2000s is most likely an outcome of the wave of refinancing during that period, as homeowners took advantage of low interest rates and rising home prices to extract value from the equity of their houses or to upgrade. It is important to note that prepayment risk is not present in corporate bonds due to different call protections. The reversal of that widening spread and the negative spreads seen in the period following the financial crisis, could be attributed to the first program of quantitative easing (QE1) initiated by the Federal Reserve. With QE1, the Fed purchased large quantities of agency debt (about $175 billion) and GSE RMBS ($1.25 trillion) in order to provide support to the mortgage and housing markets. As a result, mortgage rates dropped significantly to about 5 percent a year after QE1. Soon after QE1 ended (March 2010), the spread had tightened back to almost zero, only to widen again with the launching of QE2 in November 2010. By the end of the first quarter of 2012, the completion of QE2 brought the spread back again to zero (Figure 18).

Figure 18: 30-Year Fixed Mortgage Loan to AAA Corporate Bond Yield Spread
Source: Board of Governors of the Federal Reserve System



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