



Working Paper No. 573.2

**Securitization, Deregulation, Economic Stability, and
Financial Crisis, Part II**

Deregulation, the Financial Crisis, and Policy Implications

by

Éric Tymoigne

The Levy Economics Institute of Bard College
California State University, Fresno

August 2009

The Levy Economics Institute Working Paper Collection presents research in progress by Levy Institute scholars and conference participants. The purpose of the series is to disseminate ideas to and elicit comments from academics and professionals.

The Levy Economics Institute of Bard College, founded in 1986, is a nonprofit, nonpartisan, independently funded research organization devoted to public service. Through scholarship and economic research it generates viable, effective public policy responses to important economic problems that profoundly affect the quality of life in the United States and abroad.

The Levy Economics Institute
P.O. Box 5000
Annandale-on-Hudson, NY 12504-5000
<http://www.levy.org>

Copyright © The Levy Economics Institute 2009 All rights reserved.

ABSTRACT

This study analyzes the trends in the financial sector over the past 30 years, and argues that unsupervised financial innovations and lenient government regulation are at the root of the current financial crisis and recession. Combined with a long period of economic expansion during which default rates were stable and low, deregulation and unsupervised financial innovations generated incentives to make risky financial decisions. Those decisions were taken because it was the only way for financial institutions to maintain market share and profitability. Thus, rather than putting the blame on individuals, this paper places it on an economic setup that requires the growing use of Ponzi processes during enduring economic expansion, and on a regulatory system that is unwilling to recognize (on the contrary, it contributes to) the intrinsic instability of market mechanisms. Subprime lending, greed, and speculation are merely aspects of the larger mechanisms at work.

It is argued that we need to change the way we approach the regulation of financial institutions and look at what has been done in other sectors of the economy, where regulation and supervision are proactive and carefully implemented in order to guarantee the safety of society. The criterion for regulation and supervision should be neither Wall Street's nor Main Street's interests but rather the interests of the socioeconomic system. The latter requires financial stability if it's to raise, durably, the standard of living of both Wall Street and Main Street. Systemic stability, not profits or homeownership, should be the paramount criterion for financial regulation, since systemic stability is required to maintain the profitability—and ultimately, the existence—of any capitalist economic entity. The role of the government is to continually counter the Ponzi tendencies of market mechanisms, even if they are (temporarily) improving standards of living, and to encourage economic agents to develop safe and reliable financial practices.

See also, Working Paper No. 573.1, “Securitization, Deregulation, Economic Stability, and Financial Crisis, Part I: The Evolution of Securitization.”

Keywords: Financial Crisis; Economic Boom; Minsky; Regulation; Supervision; Securitization

JEL Classifications: E6, E42, E44, G01, G18, G28, G38

I. INTRODUCTION

The history of U.S. financial regulation and supervision has been one in which only catastrophes have resulted in meaningful improvements in the management of the financial system. Not only have there always been powerful socioeconomic interests and values to let economic agents do as they wish until the money machine breaks, but also the same forces have sometimes prevented the needed changes to be oriented toward better regulation and supervision. The early 1980s are a classic example of such a move, when Reagan's "the government is the problem" was the slogan of the day and better government regulation and supervision meant less government regulation and supervision. As a result, tremendous internal pressures were put on field examiners to be lenient, the term "reregulator" took a pejorative connotation, and people like Edwin Gray became the subject of hatred, threats, and public mockery (Black 2005; Gray in Nash 1987).

These reactive and reluctant regulatory actions have been highly ineffective at promoting a safe and reliable financial environment for economic activity, and the recent "Minsky moment"¹ is the last addition to a long list of increasingly strong financial disruptions that started in the 1950s (Sinai 1976; Minsky 1986a; Mishkin 1991; Wolfson 1994; Papadimitriou and Wray 2008). Each time, the government provided an ex post validation of financial innovations by modifying its regulatory framework to account for institutional changes and by providing emergency lending backed by those innovations, but the new framework was made rapidly irrelevant. In addition, financial institutions have become so big and intertwined, and financial innovations have become so complex, that it has become extremely difficult to regulate and supervise them properly, which has led to an increase in systemic risk.

The second part of this study focuses on the regulatory changes that have occurred over the past 30 years in order to generate the worst financial crisis of the past 80 years. This part also shows how the crisis unfolded and provides some policy recommendations. It is argued that regulation and supervision should be oriented toward managing the growth of systemic risk at the individual, sectoral, and national level by developing a specific analysis of creditworthiness that does not rely solely on default probability and credit ratings, but also focuses on the

¹ Even though the following should illustrate Minsky's theory pretty well, those unfamiliar with his approach may want to check Tymoigne (2010) to see how the current crisis is a textbook example of Minsky's theory.

detection of Ponzi financial practices. In addition, the government should put in place an industrial policy that limits mergers and acquisitions to coherent businesses, as well as manages financial innovations like we manage innovations in other industries.

II. A WAVE OF FINANCIAL DEREGULATIONS

Even though the financial innovations presented in part one have generated an increase in leverage and speculation, as well as a decline in the quality of underwriting procedures and consumer protection, additional elements have been necessary to create the worst financial crisis since the Great Depression. A “long” period during which the economy recorded stable default rates, rising asset prices, and good economic performance was crucial, but equally important was the leniency of the regulatory and supervisory systems. The effects of this leniency have been compounded by seriously understaffed supervisory agencies.

Since the 1980s, government intervention has been considered to be the problem and market self-regulation to be the solution. Participants in the financial system have been viewed as sophisticated individuals who are most able to understand what they are doing and the government has been assumed to have no expertise in banking and finance, and so should not impose any restrictions on what people do with their money. This thought is widely shared when an economy has been performing well for a long time and economic stability is advanced as the ultimate proof that companies are well-managed and strongly competitive. The following quotes by two former members of the Board of Governors illustrate this point well:

It’s regrettable that we didn’t put any teeth in the country-exposure regulations. The banks reported to us regularly, but we didn’t do anything about it. Examiners raised questions. In some cases, they got a response. Other banks said, “These stupid examiners—what do they know?” (Wallich in Greider (1987: 438))

Anyone who thinks you can run bank regulation independent from the general political climate doesn't understand. Suppose the Federal Reserve would have decided to be tougher in the seventies. There would have been an outcry, from the banks and the congressmen who get their contributions, from everyone who was sold on deregulation. "What the hell are you talking about? We haven't had a banking loss for thirty years. So what the hell are you doing with new regulations?" Congressmen would come at us. "Why do you regulators think you know more than our bank CEOs?" (Volcker in Greider (1987: 439–440))

Deregulation started with the Depository Institutions Deregulation and Monetary Control Act of 1980 and was accelerated by the Garn St. Germain Act (Cargill and Garcia 1982). Those were responsible for the reckless behaviors of thrifts (Kregel 1998; Black 2005) in order to regain a profitability that had been eroded by the competitive disadvantage created by the combination of the Glass-Steagall Act and increasingly active monetary policy following the Treasury Accord. This first wave of deregulation led to the savings and loans crisis of the mid 1980s and early 1990s. The current crisis is the result of a second wave of financial deregulations and reforms that occurred at the end of the 20th century, in combination with the 1988 Basel Accord.

First, the Financial Modernization Act of 1999 legalized the increasing diversification of financial activities undertaken by financial companies. One of the main consequences of this diversification process was that financial companies would become involved in activities in which they had limited experience and that may not be coherent with their core business. This increases the potential financial fragility of a company, as well as systemic risk. AIG is a perfect example of the danger of too much diversification toward unfamiliar activities and/or activities with a risk level incoherent with the core business. AIG was the biggest insurance company in the world, with more than 110,000 employees; its core insurance business was very strong, but it was brought down by a London subunit that employed less than 400 people who had placed large bets in the credit default swap (CDS) market (Morgenson 2008).

Second, the Commodity Futures Modernization Act of 2000 aimed at clearly defining the regulatory responsibilities of the Securities and Exchange Commission (SEC) and the Commodity Futures Trading Commission (CFTC), but in the process ended up removing the regulation of some the swap transactions from both commissions. Regarding the former, the act amended the Securities Act of 1933 and Securities Exchange Act of 1934 in the following way:

The [Securities and Exchange] Commission is prohibited from registering, or requiring, recommending, or suggesting, the registration under this title of any security-based swap agreement [...] The Commission is prohibited from (A) promulgating, interpreting, or enforcing rules; or (B) issuing orders of general applicability; under this title in a manner that imposes or specifies reporting or recordkeeping requirements, procedures, or standards as prophylactic measures against fraud, manipulation, or insider trading with respect to any security-based swap agreement (Commodity Futures Modernization Act of 2000, Section 302(a), Section 303(a))

Regarding the CFTC, the act excludes from its regulatory responsibilities nonagricultural “commodities” (defined broadly to include financial instruments (section 101(4)(13)) involved in over-the-counter (OTC) swap transactions entered into by eligible participants (like financial institutions).

No provision of this Act shall apply to or govern any agreement, contract, or transaction in a commodity other than an agricultural commodity if the agreement, contract, or transaction is (1) entered into only between persons that are eligible contract participants at the time they enter into the agreement, contract, or transaction; (2) subject to individual negotiation by the parties; and (3) not executed or traded on a trading facility. (Commodity Futures Modernization Act of 2000, Section 105(b))

Credit default swaps and equity default swaps (EDS) are covered by this section and so are not regulated by the CFTC. This left CDSs and EDSs completely unregulated by federal agencies. No state regulation applied to CDSs and EDSs either, “because a CDS is a kind of derivative, [so a naked CDS position] is not considered to be gambling and is not covered by State gaming laws” (Adelson 2004: 5). This rather poor justification of the exclusion from state gaming laws, coupled with the absence of federal regulation, led to a huge boom in the CDS market from 2001 as shown in figure 21.

Third, in August 2000, the following amendment to the Employee Retirement Income Security Act was proposed, following a request by Morgan Stanley sent to the Department of Labor in October 1999:

The proposed amendment to the Underwriter Exemptions (the Proposed Amendment) is requested in order to permit plans to invest in investment grade mortgage-backed securities (MBS) and asset-backed securities (ABS) (collectively, Securities) involving categories of transactions which are either senior or subordinated, and/or in certain cases, permit the entity issuing such Securities (Issuer) to hold receivables with loan-to-value property ratios (HLTV ratios) in excess of 100%. Specifically, the requested amendment would exempt transactions involving senior or subordinated Securities rated “AAA,” “AA,” “A,” or “BBB” issued by Issuers whose assets are comprised of the following categories of receivables: (1) Automobile and other motor vehicle loans, (2) residential and home equity loans which may have HLTV ratios in excess of 100%, (3) manufactured housing loans and (4) commercial mortgages (the Designated Transactions). (Department of Labor 2000a: 51455–51456)

This amendment (as well as others that have facilitated the involvement of pension funds in securitization activities) was approved in November 2000 (Department of Labor 2000b) and so allowed pension funds to buy SPE securities with an investment grade. Note that this means that pension funds could buy a tranche of CDO-squared with an investment grade, even though the underlying assets were partly based on noninvestment grade security classes, as shown in part one. Note also that from that time pension funds could participate in securitization procedures involving risky mortgages and home equity loans. All this was essential to boosting the demand for investment-grade SPE securities and sustaining the growth of mortgage lending (remember that since the early 2000s mortgage products were the major source of collateral for CDOs), which was essential in allowing the housing boom to proceed.

Fourth, Blundell-Wignall, Atkinson, and Lee (2008) note that in 2004, four regulatory changes combined to create ideal arbitrage conditions in favor of subprime mortgages:

(1) the Bush Administration “American Dream” zero equity mortgage proposals became operative, helping low-income families to obtain mortgages; (2) the then regulator of Fannie Mae and Freddie Mac, the Office of Federal Housing Enterprise Oversight (OFHEO), imposed greater capital requirements and balance-sheet controls on those two government-sponsored mortgage securitisation monoliths, opening the way for banks to move in on their “patch” with plenty of low income mortgages coming on stream; (3) the Basel II accord on international bank regulation was published and opened an arbitrage opportunity for banks that caused them to accelerate off-balance-sheet activity; and (4) the SEC agreed to allow investment banks (IB’s) voluntarily to benefit from regulation changes to manage their risk using capital calculations under the “consolidated supervised entities program.”

The American Dream Downpayment Act of 2003 provides down-payment assistance to low-income households, while others changes complemented this initiative by working on the lenders' side. Those changes accelerated the growth process of nonprime mortgage lending.

A fifth element that spans over the Clinton and Bush administrations has contributed to the current financial crisis. Indeed, both administrations tried to promote homeownership for low-income categories by reducing financial requirements and costs, and Streitfeld and Morgenson (2008) have criticized these moves for being at the source of the current crisis and for providing a false sense of fulfilling the American dream. For example, the National Homeownership Strategy from 1994 to 2000 and the American Dream Downpayment Act of 2003 encouraged financial institutions to be more flexible and provided help, in terms of down payments, sources, and lengths of borrower's earnings, as well as selection of appraisers (who now can be directly picked by lenders rather than from a government panel). In addition, the Federal National Mortgage Association (FNMA) and the Federal Home Loan Mortgage Corporation (FHLMC) have been blamed for being at the center of the subprime boom by holding subprime mortgages and guaranteeing payment on them.

Regarding the homeownership policy initiatives, they do not seem to have been at the source of the recent boom in subprime lending (except the 2003 Act)² or, more importantly, of the decline in quality of all loans. Indeed, even though subprime lending grew fast from 1995 to 1998 (Zelman 2007: 22), subprime lending only boomed relative to other mortgage activities in 2003 and 2004, as shown in figures 5 and 6. Moreover, down-payment requirements for low-income categories have been on a downward trend and very close to zero for a long time (recently several bills³ were introduced in Congress to authorize no down payment on Federal Housing Authority (FHA)-insured mortgages but none of them passed):

² Gramlich (2004) notes that the growth of subprime lending can be partly attributed to government programs oriented toward low-income categories and minorities, but also notes that these programs have helped those people without leading to a large delinquency rate until recently.

³ These are the Zero Downpayment Act of 2004, the Zero Downpayment Pilot Program Act of 2005, and the Zero Downpayment Pilot Program Act of 2006. They never became law. See: (<http://www.govtrack.us/congress/bill.xpd?bill=h109-3043>).

Loan-to-value ratios (LTVs) were relatively low in the early part of the 20th century, typically 50% in the late 1920s. In the 1930s, government-backed mortgages were developed and Fannie Mae came into existence. The percentage of house value required for a down payment began a decline that has continued to the present day. In the 1970s, the standard down payment was expected to be 20% of the purchase price, with selected exceptions. Throughout the 1990s, the minimal required down payment continued to fall. Freddie Mac introduced the Affordable Gold programs in 1992, consisting of a 5% down payment program and a “3/2” program under which the required down payment from the borrower’s funds is 3% with 2% in the form of gifts, sweat equity, grants, or unsecured loans from government or nonprofit agencies. In the 3/2 program the borrower’s income cannot exceed 100% of the area’s median income. The 5% down payment program is targeted at minority borrowers who are wealth constrained. The 3/2 program is targeted at severely wealth-constrained households. Following the introduction of these programs, Freddie Mac introduced the Affordable Gold 97 program, which further reduced the down payment to 3%. Innovation in this area continues, the apparent goal being to reduce the required down payment to zero. [...] According to data from the Federal Housing Finance Board, mortgages with loan-to-value ratios of 90% or more made up less than 10% of the market during the period 1989–1991, but by 2001 this share had climbed to 21%. (Herbert et al. 2005: 75)

Finally, not only has delinquency risen significantly for all types of mortgage, but also the serious delinquency on subprime loans only rose significantly recently, which suggests that as long as terms on subprime loans can be adapted to the needs of low-income borrowers, the chances of default are greatly attenuated (albeit much higher than prime, but that ought to be anticipated by lenders). Thus, there is nothing intrinsically bad about subprime lending. Where the fault lied recently was on granting mortgages (all kinds of mortgages) on the assumption that refinancing and reselling a house were a normal way to repay the mortgages; as shown earlier, this practice did only not concern home speculators.

Most of those comments also apply to the critiques of FHMA and FHLMC. In addition, their holding of private-label mortgage-backed securities (PL MBS) backed by alt-A and subprime mortgages was very limited. For example, at the end of June 2008, FNMA reported holding about \$60 billion in PL MBSs (FNMA 2008b: 42–43). Its total holding of PL MBS was about \$110 billion in a \$2.5 trillion market in 2008. What is probably more worrisome is the fact that they hold interest-only (IOs) and pay-option mortgages. Even though this represents only a small proportion of their holdings of conventional mortgages (9% for FNMA), it is probably not

wise for government-sponsored enterprises (GSEs) to hold this type of mortgages because of their Ponzi-prone structure.

Therefore, overall, those homeownership policy strategies are, at best, a compounding factor in the crisis rather than a causal factor. Nonetheless, it is true that trying to increase homeownership by loosening financial requirements is not the most effective way to achieve the goal. Raising income levels and income growth would be a better strategy to increase true homeownership instead of creating implicit renters. Indeed, given the financial terms of the mortgages and the slow growth of income, many low-income earners may never be able to repay their mortgage in their lifetime and may require several costly refinancing operations or renegotiations to be able to stay in their home.

III. HOW DID ALL THE INNOVATIVE AND DEREGULATORY FRENZY TURN OUT?

Remember that one of the initial reasons for starting securitization was to promote mortgage lending. If one looks at figure 28, it does not look like securitization in the 1970s or in the 2000s has helped to raise homeownership sustainably, even though Ranieri (one of the central figures in the creation of PL MBSs) argues that securitization helped absorb the large demand for homes from baby boomers (Ranieri in Der Hovanesian 2008).

Rather than from private initiatives, a major boost to homeownership came from the creation of FHA and FNMA, with homeownership rising from an average of 46% between 1900 to 1940, to 55% in 1950 and averaging 64.3% from 1960 to 1994. An additional boost was provided by the National Homeownership Strategy of 1994 that raised homeownership rate to 67%.

If one turns to the housing boom of the 2000s, about 75% of the U.S. subprime mortgages have been securitized in a way shown in figure 17 (International Monetary Fund 2008a: 59). The gain in terms of homeownership was, however, very limited and short-lived. From 2000 to 2004, the homeownership rate went from 67% to 69%, but then declined constantly. In addition, as shown in figure 29, the vacancy rate has climbed steadily to historical high levels since the early 2006.

The decline in homeownership and increase in vacancy were triggered by financial events, as well as by two specific policies. On the financial side, principal payments started to kick in for

IOs and teaser interest rates began to be reset to their normal interest rates. As shown in figure 30, the number of mortgages that will experience an interest-rate resetting is expected to continue to rise until the end of 2011, so defaults will continue to rise sharply if nothing is done.

On the policy side, as shown in figure 12, the Federal Reserve started to raise its interest rate rapidly from early 2004, which affected adjustable-rate mortgages (ARMs) very rapidly and progressively reduced the attractiveness of ARMs over fixed-rate mortgages (FRMs) as their cost converged, leading to a significant slowdown in ARM originations in 2006. Second, at the same time, the Treasury decided to reduce its deficit from the end of 2003 and planned to reach a surplus by 2012. These two policies progressively squeezed the income of the private sector (Tymoigne 2007) and ended the growth of subprime lending, which stagnated from 2005, as shown in figure 5. This threatened the continuation of the Ponzi process by making it more difficult to qualify a growing number of people for mortgages.

In order to counter this problem, the financial sector shifted its mortgage lending toward alt-A borrowers, as shown in figure 6, and toward more exotic forms of mortgage—relying less on interest-rate incentives and more on payment options, as shown in figure 10. In addition, as shown earlier, lending requirements (LTV, documentation, etc.) on prime and nonprime loans also loosened significantly in the 2000s. All this allowed the Ponzi process to continue, but increased the fragility of mortgage borrowers even more by generating negative amortization and increase in frauds. This also increased the fragility of financial institutions by increasing counterparty risk and by raising wishful thinking through a higher reliance on automated underwriting programs, as well as through level II and III valuation models. Given the increasing financial fragility of the private sector induced by the previous tendencies, only a relatively small decline in income was necessary to unwind the Ponzi process in the mortgage industry, which started late in 2006.

From the third quarter of 2006, serious delinquency and foreclosure rates have climbed and are still rising steadily to historical high levels, as shown in figures 31 and 32. As shown in figures 31 and 34, the very steep rise in delinquency has concerned all types of mortgage, from prime to subprime.

One may note also that FHA loans have not recorded a big increase in delinquency, casting doubt that government low-income and minority lending programs are the cause of the crisis. One also may note that ARMs have suffered much more from delinquency, which is

confirmed by figure 33, which illustrates that delinquency is significantly worse on toxic mortgages than on traditional mortgages. All this corroborates the idea that the decline in the creditworthiness of borrowers (subprime lending especially) is only part of the story, because all mortgages issued in 2006 and 2007 have performed much worse and non-FRMs are performing the worst out of all mortgages.

Because of the rise in delinquencies and defaults, the growth trend of housing reversed sharply, as shown in figure 35, and, as shown in figures 36, 37, and 38, the decline in house prices and rise in foreclosures were the highest in the states where nontraditional mortgages represented the highest proportion of all mortgages.

Thus, the decline in the quality of the mortgages, independently from the decline in creditworthiness, was a central factor in the boom and the crisis. It gave the incentive to people with a given creditworthiness to get a mortgage by giving the illusion of affordability relative to renting and, combined with the decline in creditworthiness criteria, led more people to get a mortgage. All this increased the reliance on rising house prices rather than income gains as a source of repayment for mortgages; mortgage lending became a Ponzi scheme, as shown in figure 39.

This sustained increase in price was, in turn, an essential component for the whole dynamic in the mortgage market because an increasing number of borrowers had a very low probability of repaying, so only capital gains on houses—obtained through short sale or foreclosure—could make the deal worthwhile for all parties involved in the lending deal. Expected capital gains gave the incentive for some borrowers to use houses as speculative assets and gave the incentive for lenders to provide funds in expectation of lucrative late fees and other fees induced by the foreclosure or short sale.⁴ This Ponzi process was sustained not only by speculators and crooks, but also by individuals who did not think that they would stay in the house for a long period of time, even though they were genuinely interested in staying in the house:

⁴ For states like Michigan, other factors related to the decline in the auto industry explain the sharp decline in housing after 2006. Indeed, there was no high proportion of nontraditional mortgages and the rise in home prices was moderate, suggesting that perhaps no Ponzi process was present in this state (even though mortgage frauds were quite high).

Finally, “we thought, why not live a little bit dangerously and do the interest only?” Mr. James said. “Why pay the principal if we don’t know how long we’re going to be there?” (Bayot 2003)

IO mortgages and other exotic mortgages have been taken by nonspeculators and well-intentioned individuals, but again the underwriting process was faulty in that it qualified them on the basis of interest payments or of the introductory payments, as well as by taking the “long” history of rising home prices as a given. The latter trend created a feeling that selling a home is a normal and safe way to repay a mortgage:

Fitch believes that much of the poor underwriting and fraud associated with the increases in affordability products was masked by the ability of the borrower to refinance or quickly re-sell the property prior to the loan defaulting, due to rapidly rising home prices. (Pendley, Costello, and Kelsh 2007: 1)

This is a clear illustration of the Ponzi process, for which growing refinancing or liquidation at rising price is necessary to service a given amount of outstanding debts.

As a consequence of the rise in delinquency, defaults on mortgages have started to rise sharply, as the rate of new foreclosures suggests. Loan originators and other SPE sponsors did not receive debt service payments and therefore could not service SPE securities; the profitability of financial institutions took a big hit, which led to a decline in lending activities. The credit crunch and the rise in delinquency led to a sharp decline in the approval of new mortgages and made it increasingly difficult to sell new homes or to liquidate foreclosed homes. Given that the increase in home prices was based on a Ponzi process requiring a growing number of mortgagors, the crunch led to a sharp decline in house prices.

The decline has been so steep that originators could not recover the outstanding principal of the loan as they expected. As shown in figure 40, all this has led to a large decline in the value of all tranches of SPE securities—senior or subordinated.

Defaults and large declines in the value of securities triggered the unwinding of swap contracts and other securities, which led to a sharp decline in arbitrage SPEs, as shown in figure 27. The unwinding has been so large that super-senior tranches that were supposed to be extremely safe were affected. The catastrophic event that was thought to be highly improbable

occurred and financial-market participants “realized” one more time (like in 2001 and 2005) that AAA SPE securities have a much higher default probability than AAA corporate bonds.

Given the losses, monolines, pension funds, and hedge funds (who are the main net seller of credit protection, as shown in table 2) could not meet payments on CDS and other securities. These problems were transmitted rapidly to others because, as shown in figure 41, counterparty and systemic risks have been enhanced greatly over the past decade by a large increase in bilateral netting in the derivative market (financial institutions hedging their short CDS positions by purchases of CDSs and netting out any residual exposure).⁵ Net buyers of CDSs who thought that they had hedged their short CDS positions by buying CDSs figured out that the counterparty could not pay; as a consequence, those institutions could not make good on the contingent payments required by the CDSs they sold. A “long” period of low default rates had given them the impression that selling protection on credit risk was a safe bet and an easy way to make money, and so financial institutions did not put aside any funds to meet contingent payments; if they did, the size of the funds put aside was too small to meet the required payments on securities whose value had declined tremendously, as shown in figure 39. For example, in July 2008, BBB-rated CDSs on ABSs traded at a 90% discount, on average (60% for AAA ABCDS), so large compensations have had to be provided by protection sellers.

All these developments in the CDS and other markets were compounded by additional factors, which, all combined, have led to massive liquidations and spectacular failures in the financial sector. First, the crisis made it very difficult for SPEs to refinance their positions (especially those that fund their positions in long-term partially liquid assets with short-term and medium-term securities, like asset-backed commercial paper [ABCPs] and structured investment vehicles [SIVs]), and the automatic unwinding triggers of SPEs forced them to liquidate their positions. The financial difficulty of the SPE led to a materialization of the funding risk for originators and, thus, an implicit return to their balance sheet of the credit and liquidity risks that they wanted to avoid. As a consequence, their equity capital and cash reserve were rapidly depleted, which reinforced the refinancing and liquidation pressures on the financial system.

⁵ In addition, the CDS market is highly concentrated, with ten market makers holding 90% of the existing CDSs (International Monetary Fund 2008a: 17). This is the same with all other derivative activities in the U.S. banking system that are “dominated by a small group of large financial institutions. Five large commercial banks [JP Morgan, Bank of America, Citibank, Wachovia, HSBC] represent 96% of the total industry notional amount and 81% of industry net current credit exposure” (Office of the Controller of the Currency 2009: 1).

Second, monolines (especially Ambac and MBIA) were downgraded in the middle of 2008, which contributed to massive liquidations and write-downs of structured products. Indeed, their downgrading affected the strength of the third-party insurance they provided and so the credit rating of securities relying on this insurance. Pensions and other funds required to buy only investment-grade securities had to sell some of their positions.

Combined with further actual and potential threats (e.g., the rise of margin requirements [International Monetary Fund 2008a]), all these events brought the U.S. financial system (and with it the whole U.S. economy) to the brink of complete destruction (the same applies to Europe). As a consequence, in addition to trillions of dollars of short-term advances by the Fed to meet short-term liquidity needs, the federal government had to intervene in an unprecedented manner through massive lending programs, capital injections, and purchases of toxic securities for a committed amount of \$12.1 trillion as of April 2009 (New York Times 2009). For the moment, losses mainly concern U.S. banks with write-downs totaling around \$350 billion. In October 2008, the worldwide financial sector had lost about \$760 billion, including \$580 billion by banks and about \$100 billion by insurers; the losses were mostly in mortgage and leverage loans products (International Monetary Fund 2008b: 15–16). Given the trend of home prices, interest-rate resets, foreclosures, and delinquencies, more losses and government intervention are to be expected. This is all the more true since delinquencies on nonmortgage loans are just starting to rise steeply, as shown in figure 42.

In its latest report for the United States, the International Monetary Fund (IMF) revised its estimates of expected loan and security losses upward by \$1.3 trillion compared to October 2008 and argues we can expect \$4 trillion in writedowns all over the world. Losses are expected to be concentrated mostly in the United States (\$2.7 trillion) and within banks (\$1.6 trillion for U.S. banks) (International Monetary Fund 2009: 28).

IV. COULD THE FINANCIAL CRISIS HAVE BEEN AVOIDED? AND WHAT LESSONS SHOULD WE DRAW?

A. Could the Crisis Have Been Avoided?

Most of the costs and benefits of securitization were understood by economists and serious financial-market participants from the mid 1980s.

The proliferation and growth of securitized debt raised a number of concerns [...] It was thought that [...] securitization would increase risk because it would “tend to encourage sloppy procedures and inadequate loan evaluation as each party relied on others to investigate the loans thoroughly.” (Martin in D’Arista 1994: 28–29)

In short, securitization would encourage a drift “toward a financial system in which credit has no guardian,” where “the opportunity to disengage through securitization loosens the link between creditor and borrower,” and where “misconceptions about marketability” may lead to illusion of liquidity. (Kaufman in D’Arista 1994: 28–29)

These remarks by Martin (vice chairman of the Board of Governor) and Kaufman (executive director at Salomon Brothers) were made during hearings at the U.S. House of Representative in the mid 1980s and all these concerns progressively materialized over the following 20 years, operating in a full-blown fashion in the mortgage industry from the early 2000s (consumer finance has been Ponzi since the mid 1990s at least). Hyman Minsky was among the economists who very quickly pointed to the potential problems of having “banks without loan officers” (Minsky 1981: 15; Minsky 1986b, 1987) and the macro- and microdynamics of securitization can clearly be understood within his framework of analysis (Kregel 2008; Wray 2008; Whalen 2008; Wray and Tymoigne 2008; Tymoigne 2009a). In addition to economists and financial insiders, some regulators, like Gramlich, have expressed concerns about what was going on in the housing market (Gramlich 2000, 2004; Greenspan in U.S. House of Representatives 2008: 34ff).

So the problem is not that we have not known what the problems with securitization are, but, given the political preferences of the time, it has been thought that market participants would take care of these problems and that they would not behave in a way that is dangerous for the whole system and so, indirectly, for themselves. Alan Greenspan recently had to admit that this does not hold:

I made a mistake in presuming that the self-interest of organizations, specifically banks and others, were such is [*sic*] that they were best capable of protecting their own shareholders and their equity in the firms. And it's been my experience, having worked both as a regulator for 18 years and similar quantities, in the private sector, especially, 10 years at a major international bank, that the loan officers of those institutions knew far more about the risks involved and the people to whom they lent money, than I saw even our best regulators at the Fed capable of doing. (Greenspan in U.S. House of Representatives 2008: 34)

The lack of concerns for their own survival is not mainly the result of greed and irrationality. On the contrary, most market participants behave rationally in the sense that stiff competition and short-term incentives to reach money-return targets push them to do *whatever* is legally (and sometimes illegally) possible to maintain their market shares. Unfortunately, this exclusive concern for individual financial accumulation pushes aside the long-term and indirect feedback effects that lead to financial fragility and increased systemic risk (Tymoigne 2009a). Market participants have no patience for those indirect effects, even if these indirect effects make them directly worse off, because they are too complex to include in the decision-making process or because it does not look like that market participants will be affected by them. This is where the government has a major role and where the loan officers to whom Greenspan refers have limited knowledge. Central bankers and economists are not the “dumb” people that know nothing about banking and finance. They have different knowledge that is concerned with systemic risk rather than the capacity to run a profitable banking business. Some individuals in academia and the government have taken the time to painstakingly analyze those complex indirect feedback effects but regulation was not based on the recommendations of those individuals, rather it was based on ideology and the preservation of entrenched economic interests.

B. Lessons to Draw from the Whole Process

The main lesson is that the financial sector, like any other sector of the economy, needs to be carefully monitored. Leaving the management of the economy to competition and the profit motive leads to short-termism, the search for any means to gain market shares and to sustain profit, and the prioritization of individual interest over social interest. Social interest (in this case systemic stability) should always prevail over individual interest (private financial accumulation by companies or individuals). Social interest must prevail because in the end it always does, one

way or another. When setting regulation, the interest of the system is what matters, even if it goes against short-term individual interest of anybody (or everybody) because individual interest cannot be sustained without a viable, healthy financial system.

This principle can be applied in many different ways. One way is to recognize that financial innovations, like any other innovations, must be carefully monitored (e.g., drugs or mechanical innovations). Innovation means the creation of new financial products and new ways of operating (e.g., securitization), as well as new ways of using existing financial products and institutions (e.g., interest-only mortgages extended to subprime borrowers). Let entrepreneurship thrive, but make sure to keep it in check in order to maintain financial safety and reliability. Drugs companies in the United States are competitive and have a reputation for the reliability of their products and the innovative nature of their enterprise. They are subject to strong and lengthy government oversight by FDA, which channels the innovative drives toward safe innovations. Drugs are constantly monitored and, once approved, no new drug is left unchecked and its use may be forbidden (or widened) over time. All this does not discourage innovations, nor does it reduce the competitiveness of drug companies; FDA oversight gives the latter an incentive to be prudent and to take the time to develop products that perform well, in a reliable fashion, and that clearly state what the side effects are and who should not take them, which ends up increasing the competitiveness of drugs companies. The same criteria should be applied to financial innovations. Richard Scott, chief investment officer for the Houston-based insurer Western National Corp., noted in 1997:

Many of the nouveau securities were devised—and have paid off quite handsomely—during a strong economy. “But I’d like to get them a little stress tested” by a recession to see how they really work out, he adds. (Scott in Clark 2007)

In 2004, Whetten from Nomura summarized the view of some panelists at a conference:

In particular, panelists expressed the fear that the ABS market could become illiquid during periods of stress. The ABS market is less transparent than the corporate market, and information is disseminated more slowly, particularly for mezzanine and subordinate tranches levels. Also, settlement of CDS in distressed synthetic ABS CDOs has never been tested. (Whetten 2004: 2)

These statements are a typical illustration of the way we currently approach financial innovations. Not only do we not know if they are safe or not, nor do we know if they do what they are supposed to do, but waiting for the occurrence of massive losses, unemployment, and other economic miseries is a rather odd way to test financial innovations. This would be the same as if we tested new drugs by letting them be used and waiting until people died to decide if the drugs should be removed from the market.

Innovations are central to maintaining the competitiveness of financial institutions and this concern is very visible in the Treasury's recent *Blueprint*, which proposes developing a regulatory structure that can "encourage innovation and entrepreneurialism within a context of enhanced regulation" (Department of the Treasury 2008: 28). However, the Treasury also assumes that all types of innovation are "good" (because competition will eliminate the "bad" one) and that competition and profit motive do not give an incentive to promote harmful innovations:

Treasury believes that market participants will be reluctant to self-certify rules harmful to the market place (Department of the Treasury 2008: 113)

The recent crisis is a blatant contradiction of this statement (and history shows how demagogic this statement is). In addition, if competition is the only mechanism left to select innovations, the "good" innovations will be those that raise profit, irrespective of the impact on systemic risk. What is good for Wall Street may not be good for Main Street and the criterion for selecting a "good" innovation should neither be Wall Street's interest nor Main Street's interest, but the socioeconomic system's interest (which requires financial stability to be able to durably raise the standards of living of Wall Street and Main Street). Systemic stability (rather than profit, homeownership, or other sectorial objectives)⁶ should be the paramount criterion in judging financial innovations because systemic stability is required to maintain the profitability and existence of any company. Stated in terms of Minsky's framework, hedge financing should be promoted and Ponzi financing should be strongly discouraged—and even forbidden in most

⁶ The recent innovative mortgage contracts and securities were praised for allowing low-income households to become homeowners. However, given their structure, these financial innovations also led to the emergence of Ponzi home financing and frauds, and the welfare gains were *predictably* short-lived. Some of those financial innovations should not have been allowed to exist and increased low-income homeownership may not be sustainable without further enhancing government programs.

cases—because the latter ultimately collapses. Thus, rather than pushing for all kinds of innovation that provide short-term gains and lead to long-term instability, the government should motivate financial firms to create innovations that make the United States reputable for a sound and reliable financial system, even if short-term profitability may suffer. This will be good for competitiveness by raising the quality of financial innovations. Again, all this is applied in other economic sectors and there is nothing controversial here.

Two central criteria for judging innovations should be their safety and their capacity to promote a sustained increase in the standard of living of a society. This should be constantly checked and recalls should be possible because some financial products may end up being unsafe (i.e., promoting Ponzi schemes) as the economic structures and behaviors change. Securitization may be a good innovation at heart, but it has been transformed into a Ponzi activity by substituting market regulation (which uses the profit criterion) for government regulation (which unfortunately has never used the systemic stability criterion, but instead has used whatever criterion had been pushed forward by electors). Credit default swaps should be limited to their economic purpose and “naked” position in the CDS market should not be allowed. CDO-squared do not serve a relevant economic purpose; their only purpose was to create a demand for mezzanine tranches of MBSs and CDOs in order to allow the Ponzi process to continue, and so they should not have been allowed to exist (International Monetary Fund 2008a: 59). Interest-only mortgages and payment-option mortgages were created for a very selective high-end clientele and should not have been extended to people with poor creditworthiness.⁷ In addition, even when wealthy borrowers are concerned, their use should be highly restricted and only be allowed on the condition that they do not promote a Ponzi process. As shown below, this may be hard to do, especially for payment-option mortgages and unamortized or very partially amortized interest-only mortgages, because creditworthiness may be hard to establish and may rely heavily on asset-price appreciation.

This way of approaching innovations would imply rewriting some of the rules and incentives under which the financial sector currently competes in order to limit short-termism. Many economists have noted that quarterly financial results and compensation based on short-

⁷ IOs, option ARMs, and other nontraditional mortgages were created for wealthy home buyers, “especially those with large fluctuations in monthly income, who wanted the flexibility of making low payments for a period and then paying off the loan, or a large chunk of principal, all at once” (Chui 2006: 3; Lui 2005).

term relative performances (or absolute performances) are not a good way to promote strong, long-term economic prosperity. Similarly, as Das noted, financial innovations are reversed engineered fast and margins plummet quickly, which promotes “quick and dirty” innovations. Thus, competition is good, but too much competition is not and leads to a *fuite en avant*, i.e., a situation in which participants of the financial sector care only about their own agenda and do whatever is necessary to meet it, while the whole economic system heads toward the wall at a great speed. Thus, changing employees’ reward mechanisms to make them consistent with the going-concern of a company is good. In addition, financial firms should be rewarded for creating relevant innovations. This could be done by providing a government patent that allows a company to operate for a while in a protected market; these things are already done in other sectors of the economy and have proved quite beneficial for society. Finally, we may need to establish an industrial policy for the financial sector that focuses on making sure that mergers and acquisitions involve coherent businesses and that the resulting institution is not difficult to regulate and to supervise.

In terms of government regulation and supervision, creditworthiness should be a key concept around which to center regulation and supervision. However, the government should approach creditworthiness in a different way than the financial sector. Indeed, given that the goal of the government should be to reduce the emergence of Ponzi schemes, for regulatory purposes creditworthiness should depend on the capacity to meet financial commitments through cash inflows *from core operations*. The banking-system view of creditworthiness is completely different and based on extrapolating past repayment behaviors in order to determine future repayment behaviors, *without considerations* for the actual capacity of the borrower to repay the loan from its *core* income. Thus, rather than just asking “will you meet debt payments on time?,” the question the government should ask is “*how* will you meet debt payments on time?” Someone who will be able to meet payments only through abnormal⁸ liquidation (or continuous refinancing) should not be deemed creditworthy; even if the capacity to meet payment is certain given credit history (i.e., probability of default is zero). These two views of creditworthiness—the credit-history view and the cash-flow view—are not antagonistic; on the contrary, they both

⁸ Some economic entities, like asset managers, do rely on strategic liquidation as a normal means to generate income; however, emergency/defensive liquidation is an abnormal source of funds. In addition, homes and other illiquid assets are difficult to resell quickly at low cost so liquidation is abnormal and for the economy as a whole liquidation is impossible (Tymoigne 2009a).

provide clues about the actual sustainability of a growth process. However, taking a cash-flow view of creditworthiness has several implications.

First, creditworthiness is not checked properly by simply looking at the compliance with capital requirements and liquidity requirements. Regarding the former, not only may net worth grow for reasons unrelated to profitability, but profitability is different from the capacity to earn money because of the multiple adjustments that can be made to accounting profit unrelated to net cash gain.⁹ Growing liquidity is not a good measure of creditworthiness either, not only because the sources of the growth may be unusual sources of cash, but also because the source of the growth must be compared to the cash outflows that are generated by debt services. What matters for creditworthiness is the capacity to generate core cash inflows (after operational expenses) greater than cash outflows on debt commitments, both now and in the future. Compliance to capital and liquidity requirements should still be used, not to measure the creditworthiness of firms, but rather to make sure that buffers are available in case creditworthiness is threatened. For the moment, regulation focuses mostly on capital requirements, which is inappropriate (Tymoigne 2009a: 201ff; Tymoigne 2009b). In addition, even if capital and liquidity ratios are met and companies follow “prudent” risk management strategies, it does not mean that firms are not taking excessive risk. Thus, in addition to measuring the size of the buffer available to meet existing risks, regulation and supervision should strive to detect and eliminate Ponzi financial practices. No buffer is large enough to meet the demands of a Ponzi process (Tymoigne 2009b).

Second, a central consequence of taking the cash-flow approach is that supervision and regulation should focus on cash-flow related supervision for individual banks (Minsky 1975), as well as for the whole economy. Accounting methodologies should be developed to be able to track cash flows at the firm, sectoral, and aggregate levels. National cash-flow accounting would be essential to capture the growth of systemic risk by giving a broad view of how cash flows between sectors, where cash tends to go, and how it is generated. Cases like AIG and Barings, however, show that national cash-flow accounting is not sufficient enough to detect systemic risk. National cash-flow accounting “only” helps to detect the formation of Ponzi processes at the

⁹ Black (2005) provides a detailed narrative of how the thrifts could manipulate accounting rules to maintain the appearance of profitability (and so protest further government supervision) while being financially rotten. Das (2006: 138–141) provides further illustrations of those accounting illusions. Other authors (Wray 2006; Kregel 2006; Tymoigne 2009a) have shown the limits of the concept of equity to measure the financial health of a company and its prudence.

national level, it does not help to detect the formation of Ponzi processes within companies or within a sector of the economy.

Third, in the cash-flow view of creditworthiness, the latter should be differentiated from probability of default, credit rating, and FICO score. Indeed, rather than measuring the risk of the emergence of a Ponzi process (“how will you pay on time?”), these three concepts measure the risk of loss for the lender (“will you pay on time?”) by measuring the chance that one will repay independently of the capacity to repay (through core cash-flow sources). Of course, the probability of default is highly relevant for bankers because some borrowers may default even if they still can repay. As the current crisis shows, if home value declines steeply and generates large negative net worth, it may make economic sense for some individuals to default even though they could still easily service the mortgage (Congressional Budget Office 2008; Elul 2006; El Boghdady and Cohen 2009). Thus, probability of repayment is much more important for bankers than knowing how the borrower will repay. Similarly, as shown earlier, credit “ratings are driven by the size of credit support, which is, in turn, driven by the expected losses from the pool, which are driven by the inherent risk of default in the pool” (Kothari 2006: 61). Thus, “ratings of mortgage-backed structured instruments relied heavily on CRAs’ assumptions about future house-price movements and broader economic conditions” (Financial Stability Forum 2008: 35). Indeed, house price trends affect the default probability (by affecting the negative-equity trigger) and the recovery rate, which are both central to determining expected losses. Finally, the FICO score also tries to answer the “will you repay on time?” question based on credit history, which depends on past delinquencies, past foreclosures, outstanding debt amounts, types of credit, and other elements present in the credit report. It is rather straightforward to notice that the FICO score does not take a cash-flow view of creditworthiness, because neither borrower’s income (or employment history) nor the interest rate on outstanding debts are included in the calculation of the score (Fair Isaac Corporation 2007: 10).

By now, the reader should be able to see that a very dangerous feedback loop can emerge from the credit-history approach to creditworthiness. Indeed, some people will qualify for a loan not because it is expected that they can pay, but because it is expected that collateral price will go up. Thus, the rating process may encourage a Ponzi process. For example, the faster the housing-price growth, the higher the recovery rate, and the lower the default rate, then the lower the expected loss, the higher credit ratings, and the more people qualify. All of this sustains the

growth of house prices until not enough people can be qualified relative to the number of foreclosures. Thus, a Ponzi process may contribute to a decline in default probability and an increase in credit ratings, while creditworthiness would actually worsen if judged with the criteria of “how will you pay on time?”¹⁰ In addition, as shown earlier, data inputted to calculate the credit score can be manipulated to raise credit score (Creswell 2007) and combined with a period of good credit history (irrespective of how the repayments have been made) may help to create a Ponzi process:

Until a few years ago, FICO was just one factor in the underwriting process. But as Wall Street grew hungrier for mortgages it could stuff into securities and sell to investors, it came to value FICO as an easily understood risk measure. Lenders were all too happy to use it as a substitute for laborious underwriting. “There were investors around the world demanding more and more deals, with investment bankers happily supplying the business,” says Ron Chicaferro, a mortgage consultant in Scottsdale, Ariz. “It trickled down to the lender, who told their sales force, The faster you can get me a score and close a loan, the better. We’ll forgo the documentation.” (Foust and Pressman 2008)

By taking a cash-flow view that measures creditworthiness at the individual and national levels, the risk of the occurrence of a Ponzi process will be limited and so the possibility of *large* negative equity will also decline (negative equity is not the only source of default and has to be quite large to generate default). This lowers the default probability and therefore contributes to the health of bankers.

Further work should be devoted to this distinction between creditworthiness, willingness to repay on time, and expected loss. Bankers are more interested in the latter two because they affect their profitability greatly, but a good credit history may have been sustained only on the basis of a Ponzi process, not necessarily at the level of the borrower, but rather at the level of the whole society. We need a painstaking analysis of borrowers’ cash inflows and cash outflows based on sources. This should be done by bankers who play the role of “skeptics,” as Minsky used to say, and regulators should encourage bankers not to lend to borrowers on the expectation that liquidation will be the normal cash inflows that allows loans to be profitable; this should be done before financial claims are securitized and resecuritized. This will make financial business

¹⁰ The positive feedback loop emerging from the interaction between asset prices and willingness to lend was recognized a long time ago by economists (e.g., Veblen 1904).

less glamorous and more time consuming, but it may be the price to pay for enhanced stability and a financial system that responds to the needs of society.

The measurement of creditworthiness should account for cash-flow considerations and should be based on expected normal cash inflows relative to expected cash outflows from liabilities. Expected cash outflow from debt service payments should be based on the normal interest rate and amortization rate, not the introductory terms. For example, in order to qualify someone for an IO mortgage, the income of the borrower should be compared to the complete debt-service payment, including principal, even if the borrower plans to leave the house before principal payment begins. In addition, the liquidation of the home should be considered as an abnormal source of cash inflow and so should not be included in the measurement of the capacity to repay a mortgage. Doing otherwise will contribute to a Ponzi process because an IO mortgage that is unamortized, or only very partially amortized, relies heavily on the capacity to sell the house at the same or higher price. This does not mean that the lender should not include the possibility that the value of the home will decline before granting a loan, but that is different from figuring out if the borrower *can* meet payments. Considerations about the value of the home should enter when a banker evaluates the possibility that a borrower may not be able to repay a mortgage on its own; even though, at the moment the loan is in the approval process, it is expected that he can. Relevant questions would be “what is the decline in house price that will prevent to recovery of financial stakes in the event a borrower unexpectedly default?” “what is the decline in home price that would be necessary to generate a default?” Thus, home prices matter to determine the profitability of a mortgage, but they would also be used as a means to determine the available buffer against unexpected incapacity to pay, rather than as a means to figure out capacity to pay.

A potential suggestion could be to try to combine the two views of creditworthiness. One way to do that would be to develop credit ratings that give information about the expected method of repayment. Recently, it has been suggested that SPE securities should have a different credit-rating scale from corporate bonds. However, more than a change in the lettering, we need a change in the information provided so that the credit rating responds to the preoccupations of regulators rather than only to the preoccupations of financial investors. An entity whose high creditworthiness rests mainly on the expected capacity to resell its encumbered assets at a higher price should have a AAA_L rating, where L stands for liquidation. On the contrary, an entity for

which the capacity to repay is mainly based on its normal economic activities should have a AAA_I rating, when I stands for income (as in income from the operation of an asset, rather than its liquidation, is usually the normal source of cash inflow). This would provide lenders with a view of expected losses (will you pay on time?) while at the same time providing a view of the growth of the Ponzi process to regulators (how will you repay on time?). The more AAA_L grows relative to AAA_I, the more a Ponzi process has a chance to develop in full-blown fashion and so some corrective actions should be taken by regulatory agencies. In addition, hopefully this will give some courage to regulators and supervisors to intervene, even though everybody is making money and is benefiting from the continuation of the process (bankers make money and gain market shares, people access homeownership, retirees make huge capital gains, etc.) because the increasing reliance on a Ponzi process will be there for all eyes to see. However, this is not proactive enough and we need a direct detection of Ponzi tendencies to prevent their emergence in the first place.

In terms of central banking, the crisis shows that a lot of work is needed to understand and measure systemic risk. Unfortunately this work has been limited by central bankers' belief that output inflation and economic growth are their core preoccupations, and by a theoretical framework that does not account well (or at all) for financial issues and the intrinsic instability of capitalist economies induced by competition, social rationality, and other factors. Central banks were not created to deal with production-related issues, but to deal with financial issues. There needs to be a change in priorities in terms of the goal of the central banks (Tymoigne 2009a). In addition, the government should intervene *constantly* against market forces that push for the use of Ponzi financing schemes (speculative or not, fraudulent or not). This is very different from the sporadic reactive intervention that has been practiced for centuries, which has consisted in letting the system go on and saving it *in extremis* from complete collapse through a massive government intervention.

V. CONCLUSION: DO WE NEED THE SAME REGULATION?

Maintaining competitive profitability requires that financial institutions constantly innovate by creating new financial products or by using existing financial products in riskier deals. Over enduring periods of relative calm (small, short recessions), innovations involve higher leverage

and higher credit risk, and it is the duty of the regulator to adapt regulation and supervision as quickly as possible before things get out of hands. Regulators must discourage Ponzi innovations, even if financial institutions claim that it is the only way they can maintain their profitability and stay competitive. Regulators must discourage those developments because ultimately they lead to financial crises, destroy financial institutions, and threaten the viability of the entire economy. Past and recent trends in regulation, however, do not provide great hope that a proactive regulation will occur. On the contrary, the past and current practices of regulation have been to let financial institutions do whatever they can to counter existing regulations and to boost returns as much as possible; there have been strong political pressures (from the public, the government, and financial institutions) to prevent regulators from “messing with people’s money,” as the popular saying goes. As a consequence, the regulatory framework progressively became useless, and regulators and supervisors became unaware of, or unwilling to deal with, the changes occurring in financial institutions. An inappropriate regulatory framework itself contributes to financial fragility by creating perverse incentives and by destroying financial institutions that stick to the regulatory framework rather than try to evade regulation. Only when a crisis occurred, which usually entailed massive government intervention and an ex post validation of innovations, has the government considered changing regulation significantly, but this was usually too little too late and was rapidly made irrelevant by innovations.

The current crisis is the result of a long process of deregulation and unchecked financial innovations that ultimately led to a decline in underwriting standards and consumer protection. These changes were driven by a long period of economic stability (which pushes one to find new ways to make money as markets saturate and gives the confidence to increase leverage in financial innovations and existing economic activities), cut-throat competition (which pushes one to innovate frenetically and promotes sloppy underwriting and rating standards), and beliefs that market mechanisms and profit motive always lead to socially optimal outcomes and that the government should get out of the way (which leads to great political and social pressures on regulators and supervisors).

Most analysts have pointed at subprime lending, speculation, and greed to explain the crisis. While these factors are contributing factors, they are not the main factor. Not only was subprime lending half of the story in terms of nonprime lending (alt-A was as bad, if not worse), but nonprime lending is not synonymous with “bad” lending or Ponzi lending. On the contrary,

nonprime lending may be a perfectly normal way to make business, as long as the financial terms are adapted to the needs of the borrowers *and* are related to their core income so that borrowers have chance to repay. Of course, default rates are much higher on nonprime loans, but that is a given, and lenders who decide to enter into this business should be able to protect themselves against this higher default rate. In addition, both prime and nonprime mortgage delinquencies have risen to historical highs, which shows that nonprime lending (even more so subprime lending) is only part of the story.

Speculation also is not the main cause of the current crisis because some people have entered Ponzi-inducing mortgage even though they did not plan to speculate with their house, and because mortgage companies were forced to enter in the Ponzi process for reasons as simple as justifying their staffing.¹¹ Ponzi processes (i.e., processes that involve [planned or forced] liquidation, and/or growing refinancing, to meet debt commitments) and speculation (buying with the expectations of reselling to make a profit) should be distinguished clearly, as the former is far more dangerous than the latter.

Finally, greed also is not a main cause because greed needs to be nurtured for it to flourish and the current crisis could have occurred without greed. I would not deny that greed is important, it is, but it is only part of a grander mechanism that gives incentive *and forces* one to behave in a greedy way. Market mechanisms pushed economic entities to behave in a greedy way in all good conscience, even if they are of high morality, because greed is necessary for their own economic survival. In addition, individuals may find comfort in the fact that “everybody else does, it so it must be ok.”¹² Overall, it is not a question of morality and “bad” behavior, but one of systemic failure. Financial institutions have been supervised on an individual basis to uncover “bad behaviors” without recognizing that the system itself encourages (legal and illegal) dangerous financial practices and that everybody may be behaving “properly/wisely/cleverly” according to the norms of behavior, but still may generate great systemic instability.

¹¹ In terms of consumer finance, the Ponzi process was the result of growing income inequality, growing consumerism (and so the brainwashing of people by credit card companies and producers), and a decline in health and healthcare benefits. This led people to willingly use a growing amount of revolving funds to a point where they could not afford payments, and also created a large increase in economic insecurity (e.g., a person gets sick and relies on credit cards to pay bills including other credit cards); both lead to deliberate and accidental use of legal Ponzi finance.

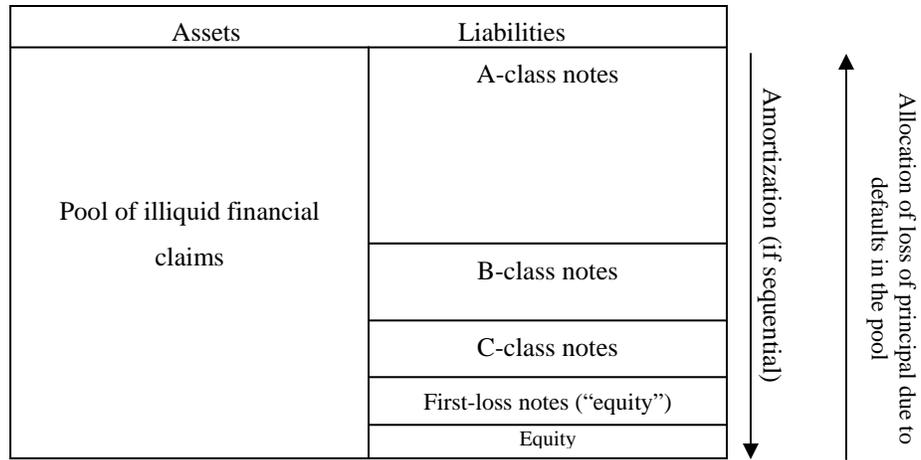
¹² Other individuals did not find such comfort and were highly disturbed by what was going on. They refused to go along and some of them did not tolerate the social pressure and committed suicide (Daussy 2008).

The main cause of the crisis is that, following Minsky, “stability is destabilizing.” Over a period of time, market forces promote Ponzi processes: low and stable default rates lead to lower interest rate, which (in combination with rising central bank rate) squeezes yield spreads and leads to an increase in leverage to improve return; low and stable default rates lead to a low proportion of distressed bonds, which leads to an increase in leverage to improve return; familiarity with new financial products leads to more daring behaviors and high use of leverage; a long period of expansion leads to the maturing of financial products and declining margins of profit, and so a diversification of existing products toward more exotic uses; and so on. Tymoigne (2009a) provides broader explanations of those mechanisms first analyzed in a systematic way by Minsky. We need to learn to contain those destabilizing forces while allowing entrepreneurship and innovation to thrive to benefit the whole society. For the moment, society has failed to do so and we are all to blame (some far more than others) for the current crisis.

The crisis has led some economists and others to advocate for a change in the trend of government deregulation. Regulation and supervision are needed, but they need to be proactive and to serve the social interest rather than any particular individual interest (Tymoigne 2009b). An effective way to be proactive is to regulate innovations so that the government is constantly aware of the changes in the system and can adapt regulation and supervision immediately rather than after a catastrophe has occurred. Another way is by focusing regulation and supervision toward the analysis and prevention of systemic risks. Through these means, the government will promote a regulatory framework that encourages entrepreneurs and other members of society to focus on social interest and will limit regulatory arbitrages. A relevant way to promote financial stability (social interest) is to have a regulatory and supervisory framework oriented toward analyzing cash flows at the individual, sectoral, and systemic levels, as well as toward discouraging Ponzi financial practices. This will require a large amount of work, and probably a change in the economic paradigm, but ultimately will allow the government to have an influence on the social norms that economic entities use in their individual search for monetary accumulation. Regulation and supervision should be oriented toward encouraging economic entities to behave in a way that is good for society as a whole.

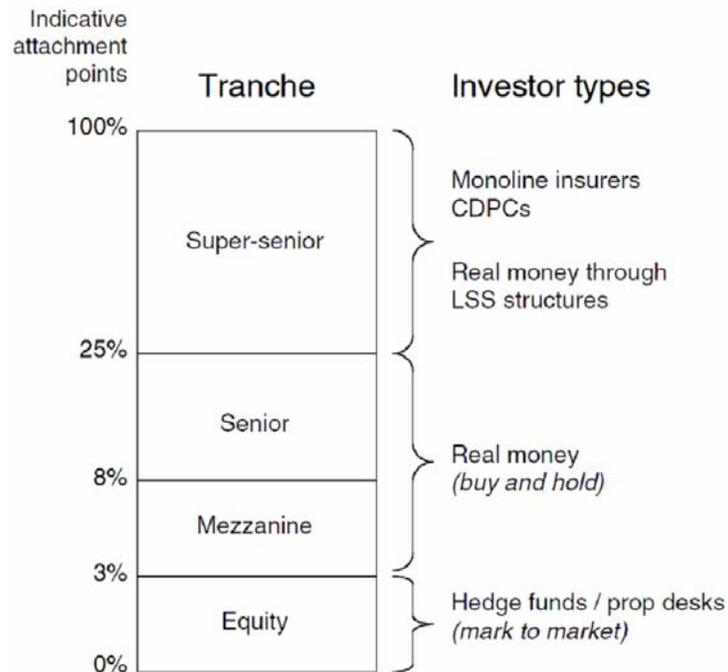
FIGURES AND TABLES

Figure 1. SPE Structure Set-up for Balance-sheet Purpose with Sequential Amortization



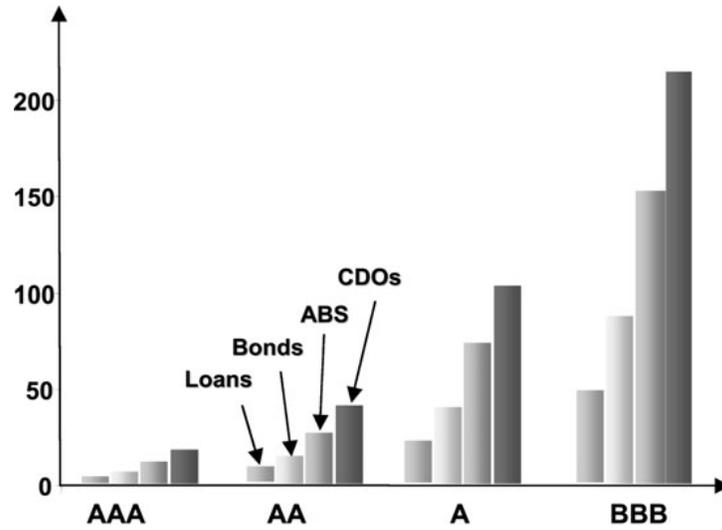
Note: Arbitrage SPEs have more or less liquid assets on the assets side and allocation of losses also depends on realized losses in the market value of assets.

Figure 2. Security Buyers for Each Tranche Exposure



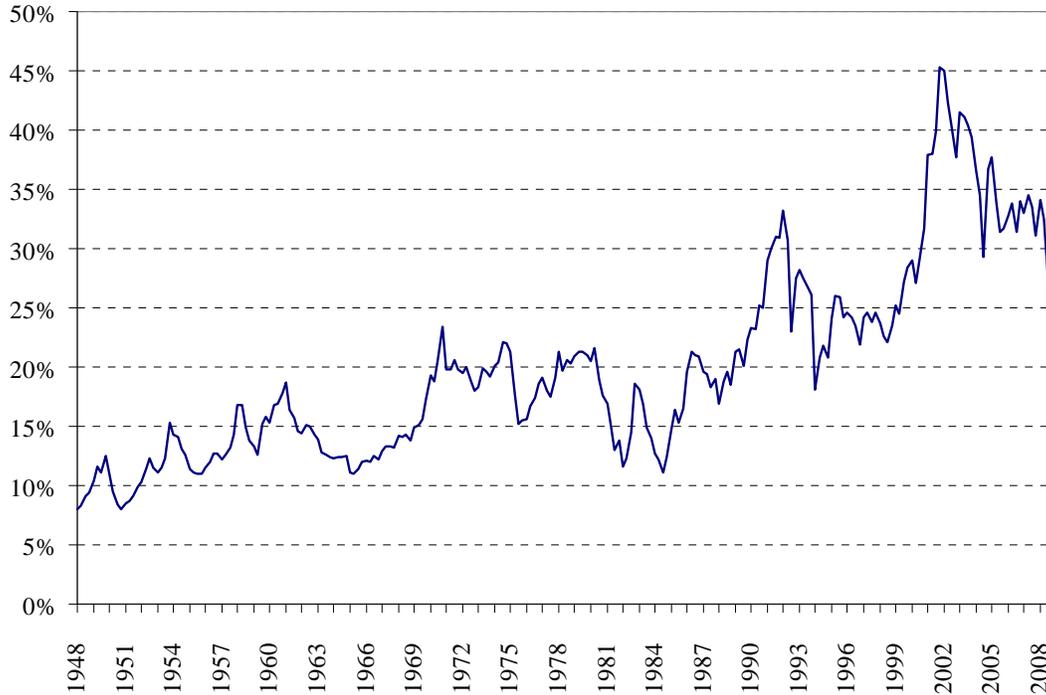
Source: Bond Market Association (2007: 768)

Figure 3. Average LIBOR-Spread per Rating for Various Asset Classes



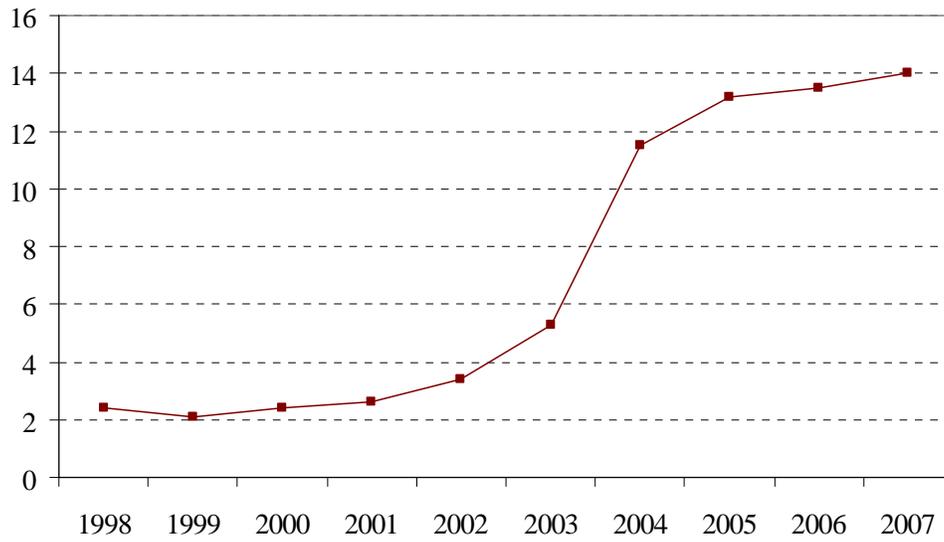
Source: Renault (2007)

Figure 4. Proportion of Corporate Profit Received by the Financial Sector, Excluding Federal Reserve Banks



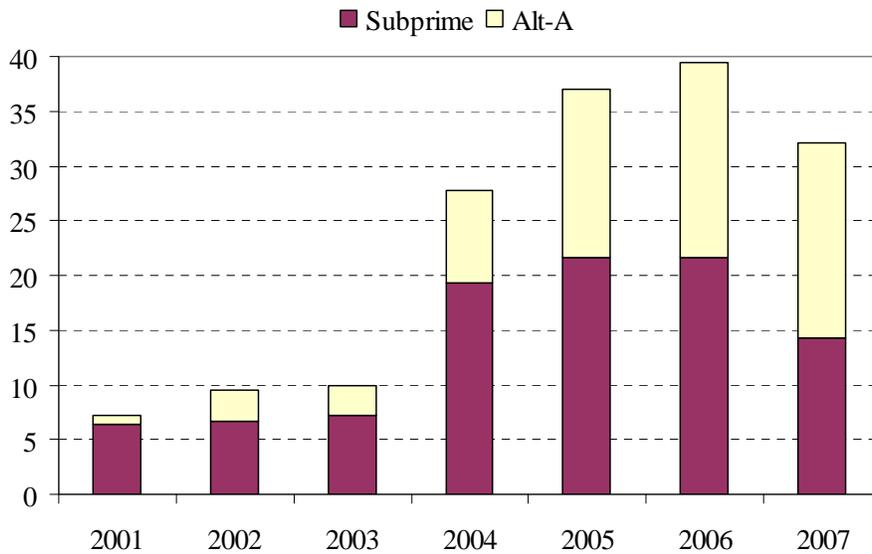
Source: BEA tables 6.16B, 6.16C, and 6.16D. Corporate profit with inventory valuation and net of capital consumption.

Figure 5. Share of Subprime Mortgages in Outstanding Mortgages



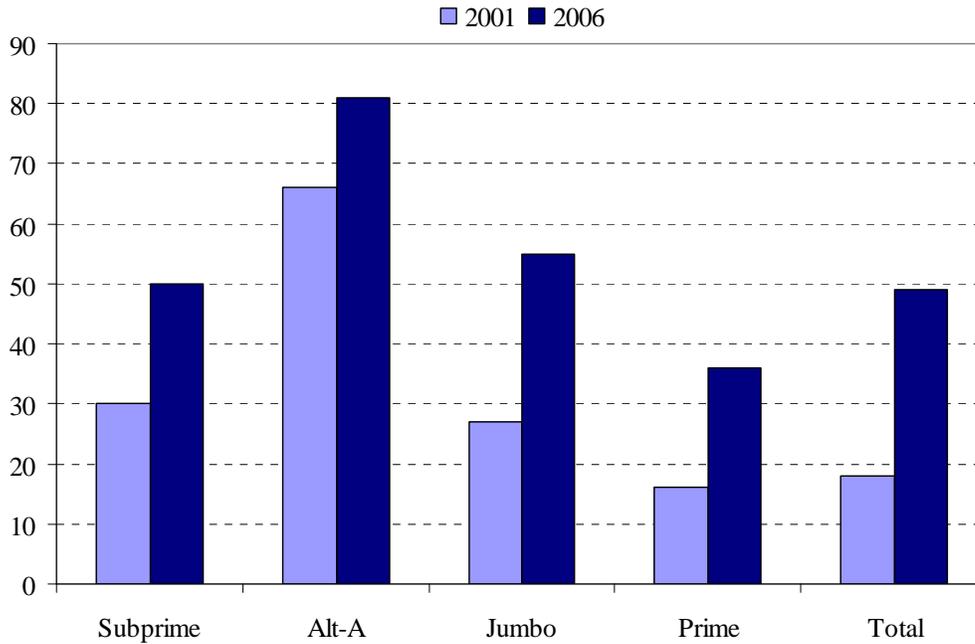
Source: Mortgage Bankers Association in Rosen (2007)

Figure 6. Share of Nonprime Mortgages in Securitized Purchase Mortgage Originations



Sources: Loan Performance and Credit Suisse in Rosen (2007)

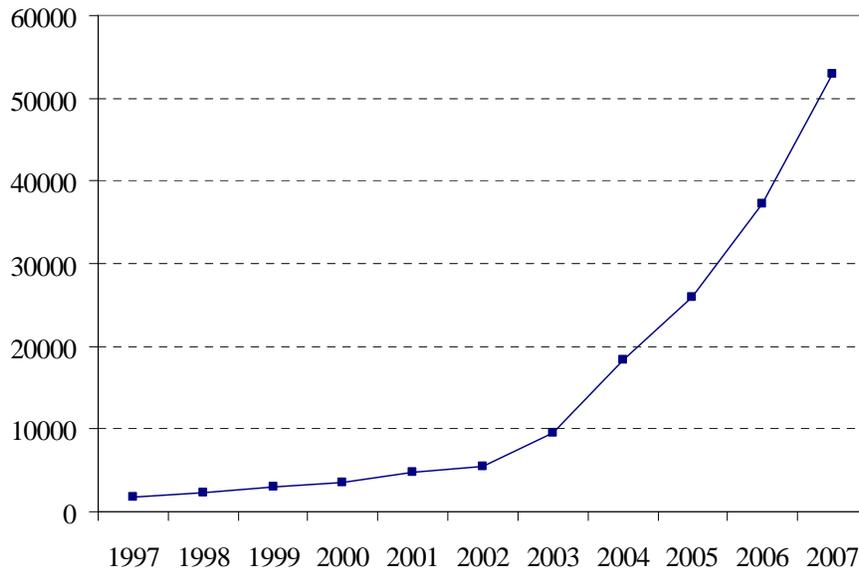
Figure 7. Distribution of Low/No-Doc Share of Purchase Origination (Percent of Origination Dollars of Securitized Loans)



Sources: Loan Performance in Zelman (2007)

Note: Prime mortgages have 0% of no-doc mortgages (Zelman 2007: 13)

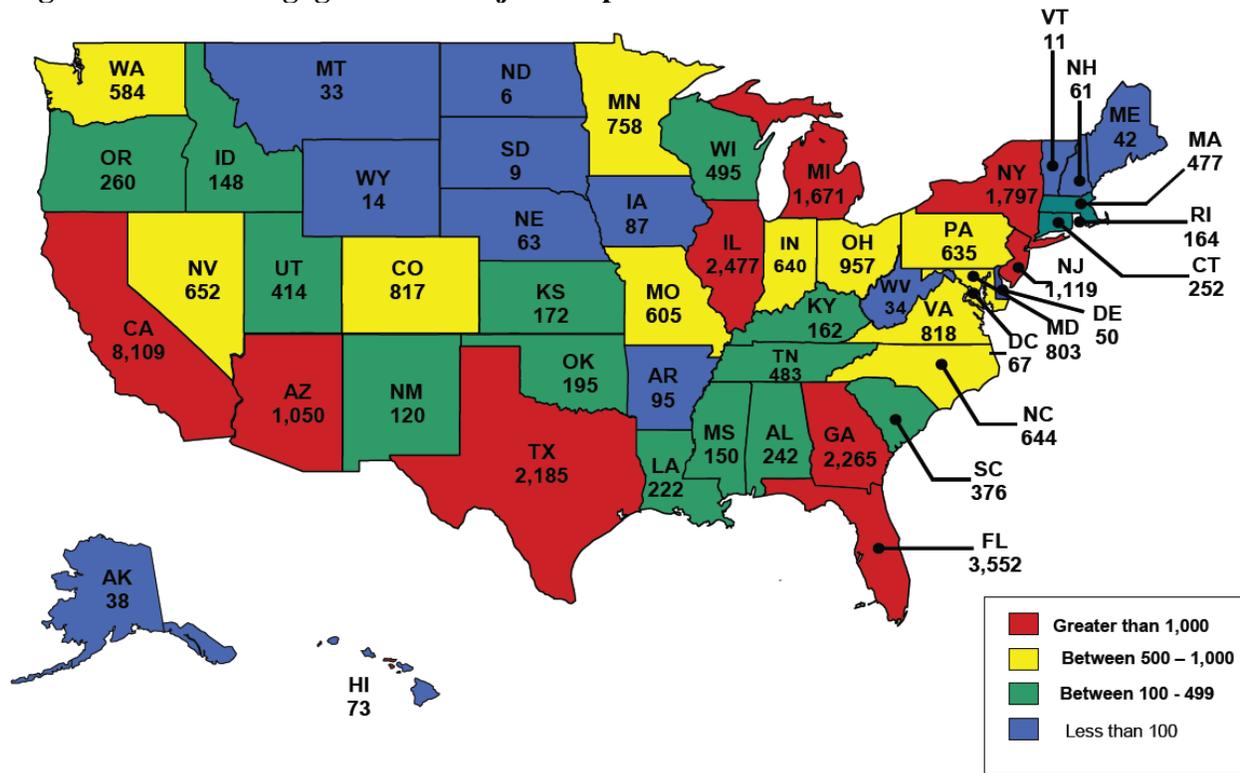
Figure 8. Number of SARs Reporting Suspected Mortgage Loan Fraud



Source: Financial Crimes Enforcement Network (2008)

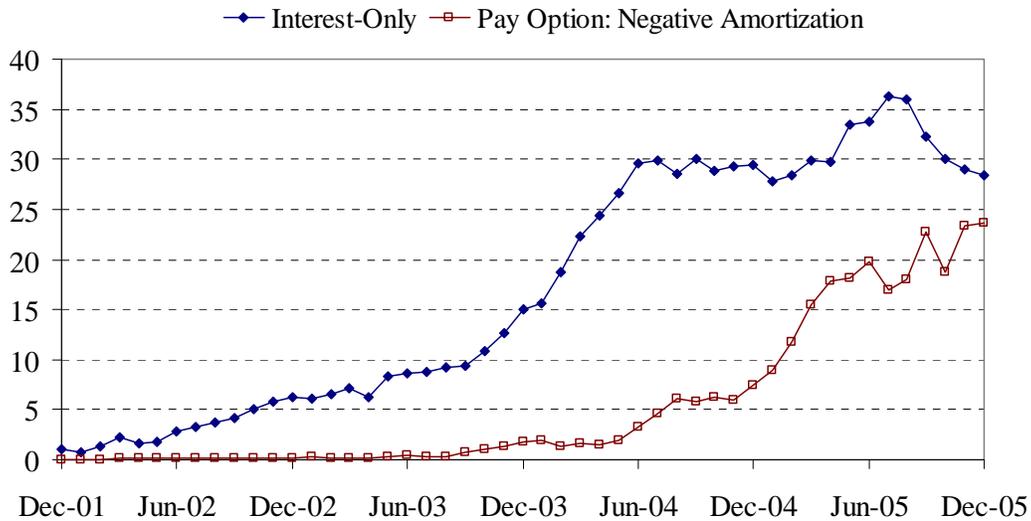
Note: SAR means suspicious activity report

Figure 9. 2006 Mortgage Fraud Subject Map



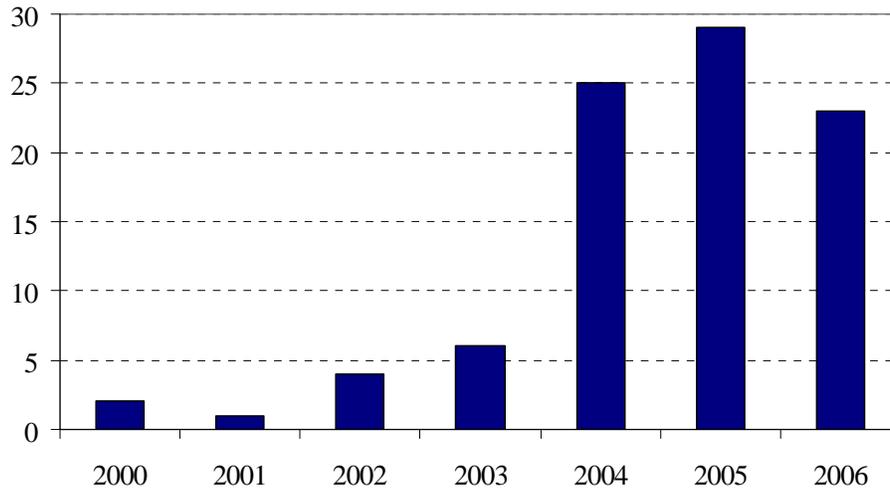
Source: Financial Crimes Enforcement Network (2008)

Figure 10. Proportion of Newly Issued Nonprime Mortgages with Nontraditional Characteristics



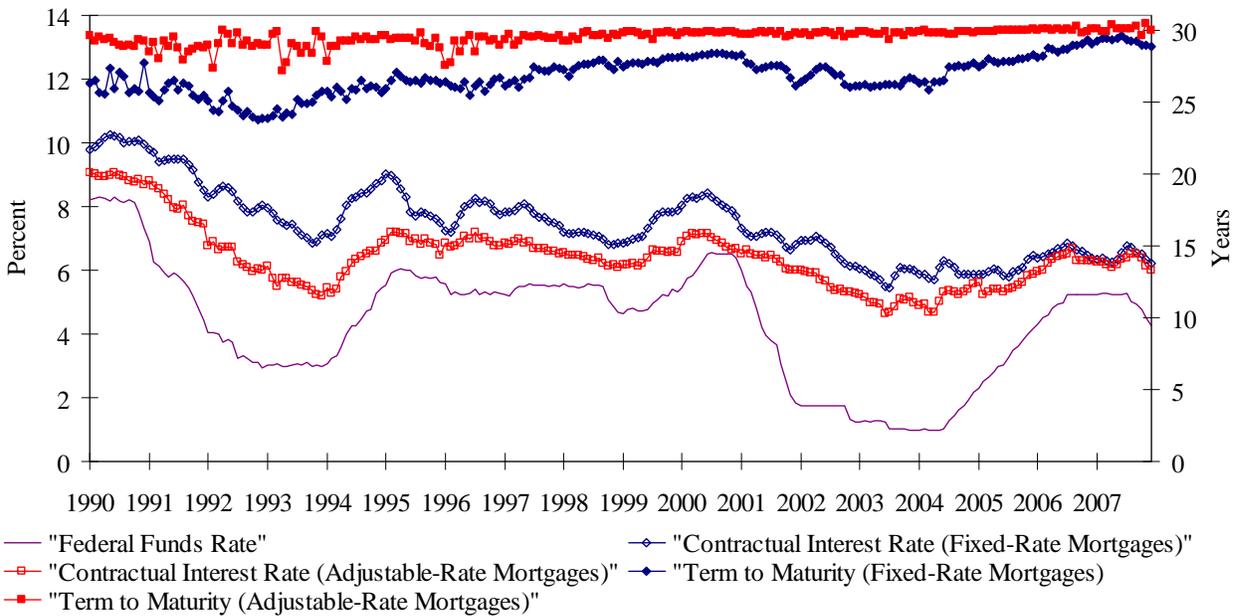
Source: FDIC Outlook, Summer 2006. Nonprime mortgages are alt-A and subprime mortgages.

Figure 11. Share of Interest-Only and Payment-Option Mortgages as a Percent of All Mortgage Originations Purchased, 2000–2006



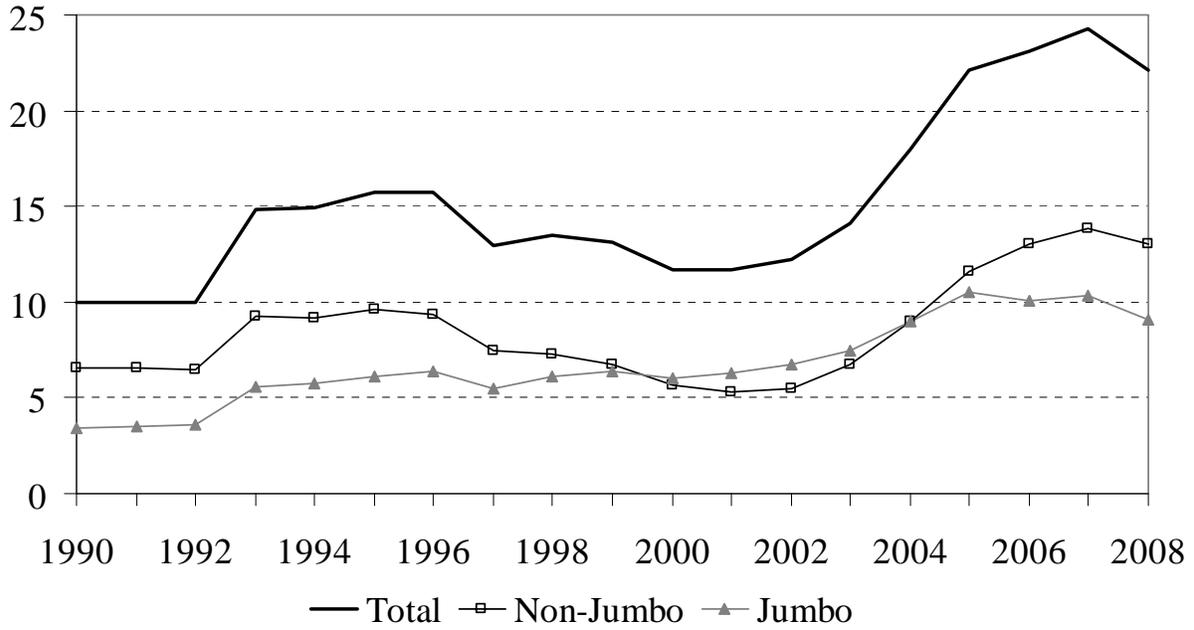
Source: Loan Performance and Credit Suisse in Zelman (2007)

Figure 12. Terms on Conventional Single-Family Mortgages, Monthly National Averages, All Homes



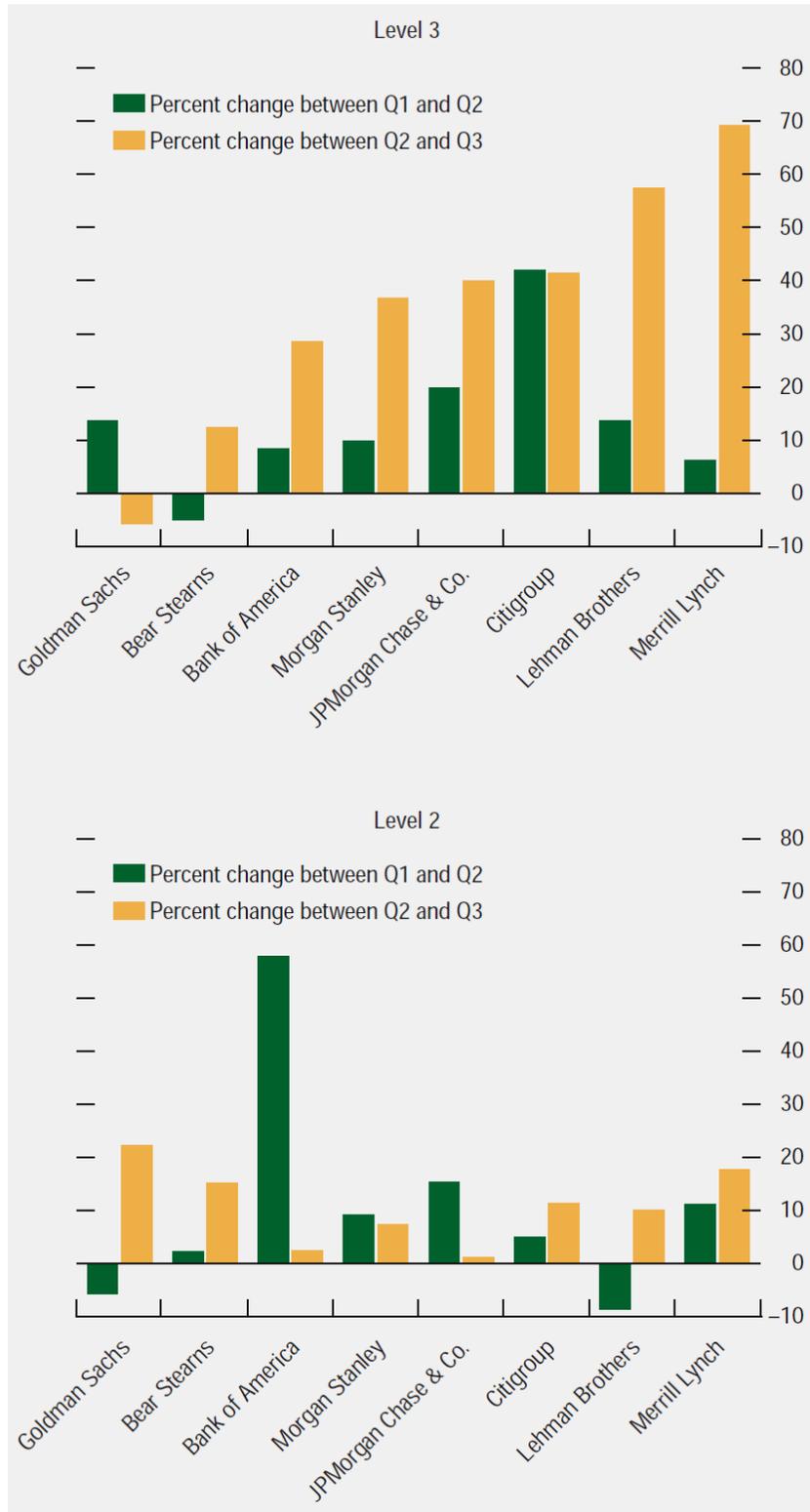
Sources: Federal Housing Finance Board, Board of Governors of the Federal Reserve System

Figure 13. Proportion of Conventional Single-Family Mortgages with Adjustable Rate



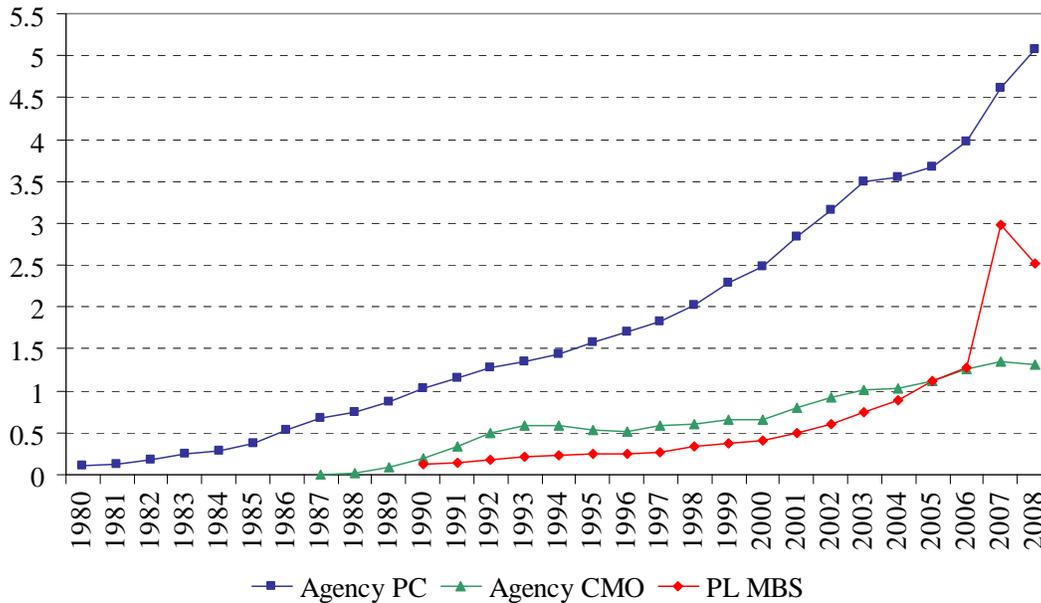
Source: OFHEO. Average of the first three quarters for 2008.

Figure 14. Selected U.S.-based Financial Institutions: Change in Level 3 and 2 Assets (Percent Change, 2007:Q1–2007:Q3)



Source: International Monetary Fund (2008: 66)

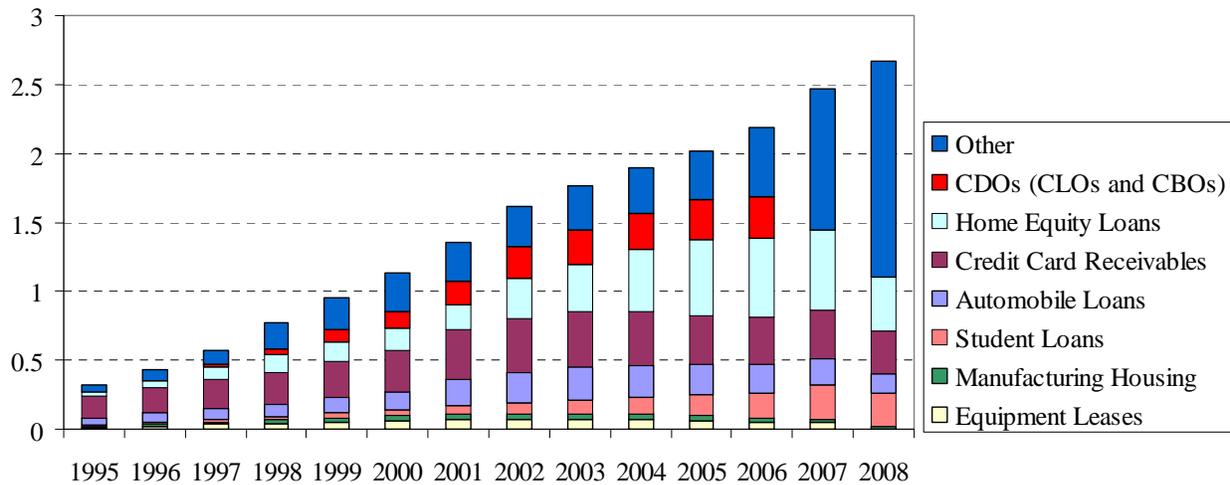
Figure 15: Outstanding Volume of Mortgage-Related Securities at the End of the Year (Trillions of Dollars)



Sources: BMA, SIFMA, GNMA, FNMA, FHLMC

Note: By convention, agency MBSs and CMOs include those issued by FNMA and FHLMC, even though they are private corporations.

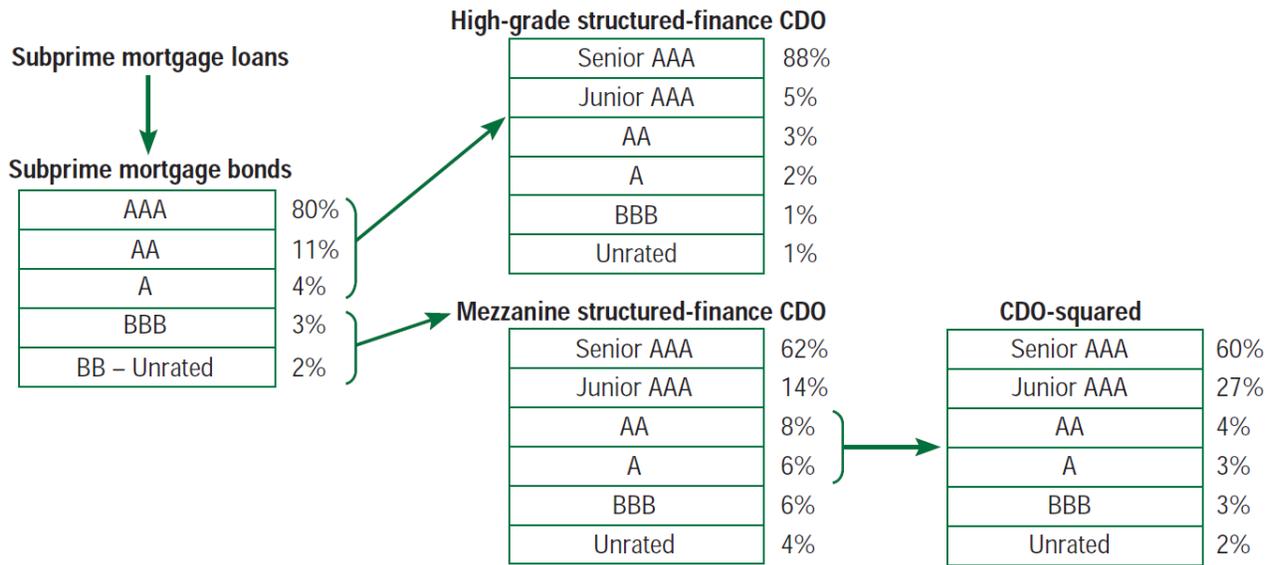
Figure 16. Types of Financial Claims Backing Outstanding Asset-Backed Securities, Excluding Mortgage-Backed Securities (Trillions of Dollars)



Source: SIFMA, Bond Market Association.

Note: From 2007, CDOs are included within "other" and the same applies to equipment leases from 2008. "Other" includes auto leases, small business loans, trade receivables, claims on intangibles, nonperforming loans, and other miscellaneous financial claims.

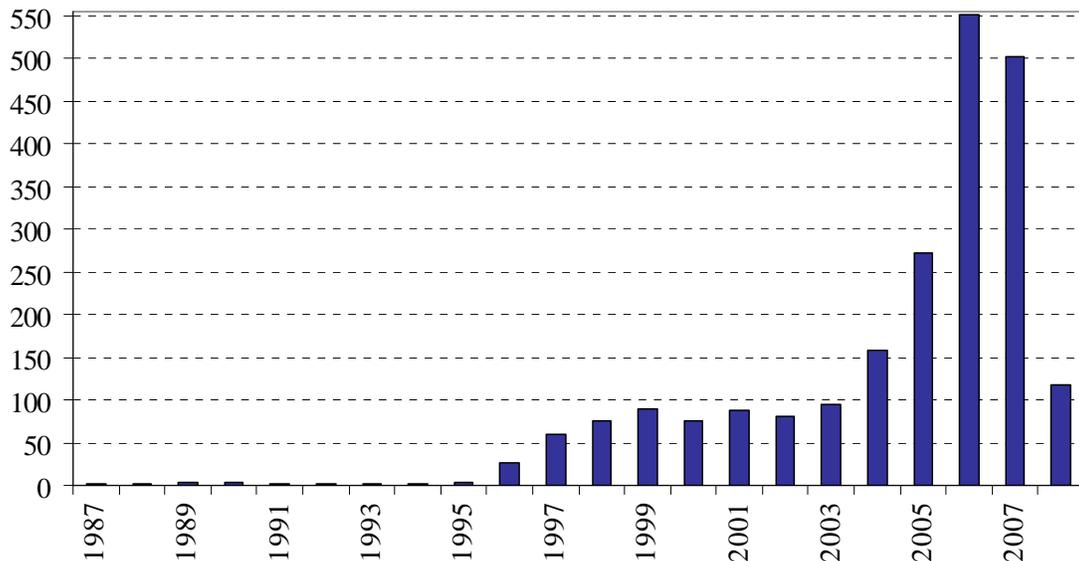
Figure 17. CDO-squared in Subprime Mortgage



Source: International Monetary Fund (2008)

Note: About 75% of subprime mortgages loans were used as collateral for subprime mortgage bonds (International Monetary Fund 2008).

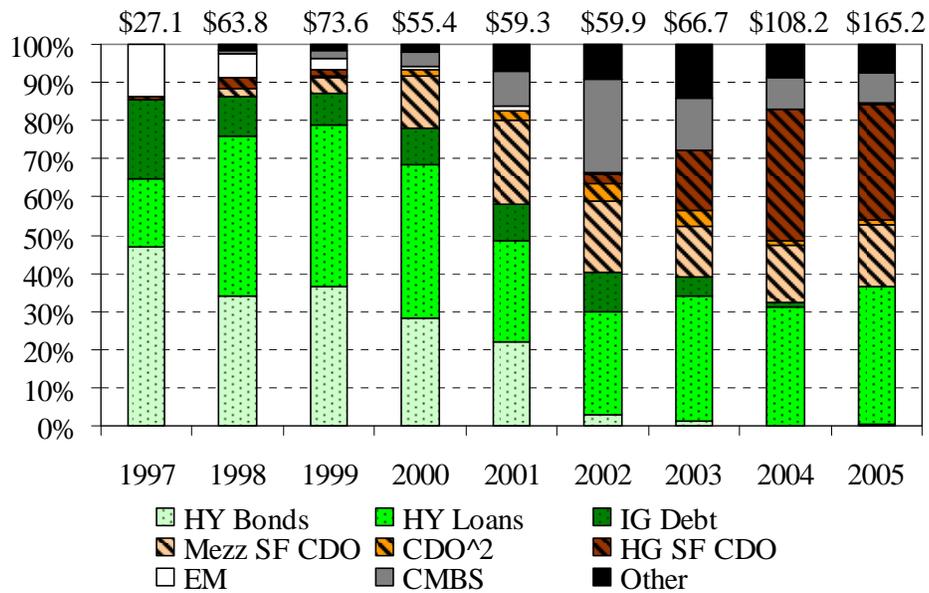
Figure 18. Worldwide Issuance of Cash Funded CDOs (Billions of Dollars)



Sources: Kothari (2006) (before 1996), FDIC *Outlook* Fall 2006 (1996-2003), SIFMA (2004-2007), abalert.com (2008)

Note: Data about CDOs (and other structured products) are hardly standardized. Data for unfunded synthetic CDOs is not available.

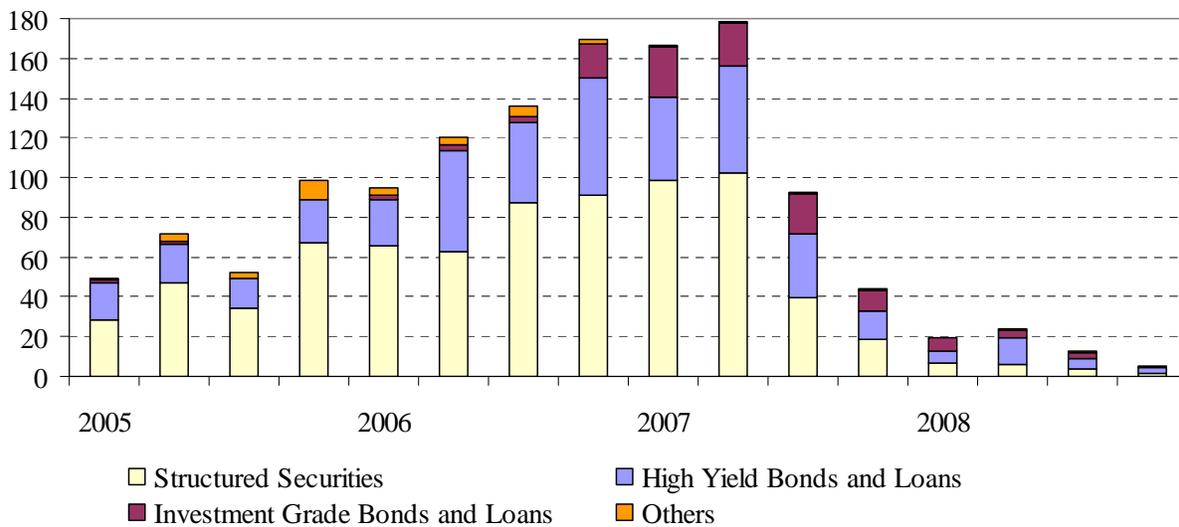
Figure 19. Collateral of Newly Issued Cash CDOs in the United States, 1996–2005 (Billions of Dollars)



Source: FDIC Outlook, Fall 2006.

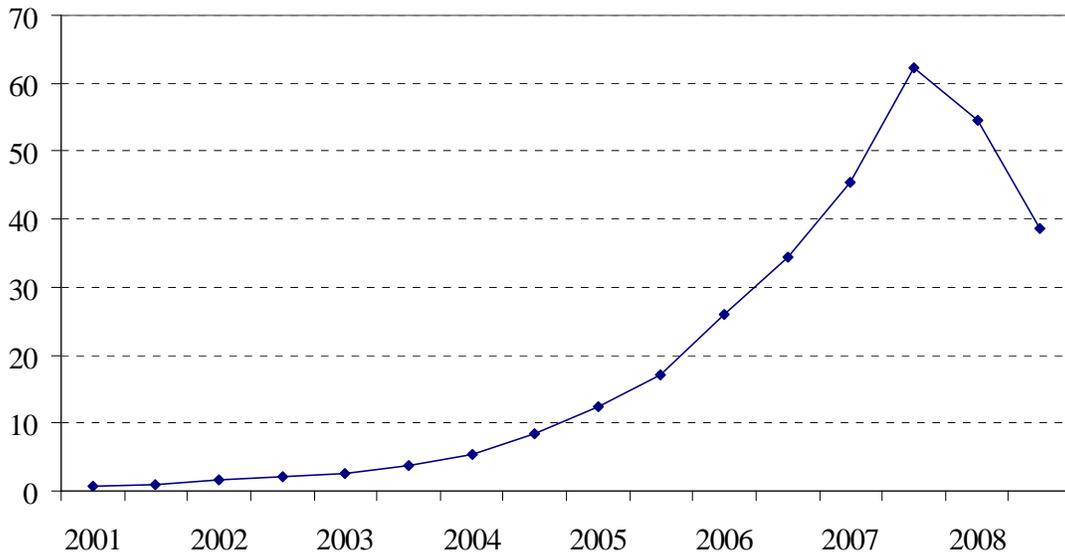
Note: HY = high yield, IG = investment grade, CDO^2 = CDO squared, HG SF = high grade structured finance, Mezz SF = mezzanine structured finance, CMBS = commercial mortgage-backed securities, EM = emerging markets.

Figure 20. Global Issuance of CDO by Collateral (Billions of Dollars)



Source: SIFMA

Figure 21. Notional Amount of Credit Default Swaps (Trillions of Dollars)



Source: ISDA

Figure 22. SPE Structure in a Fully Funded (or “Unleveraged”) Synthetic Deal

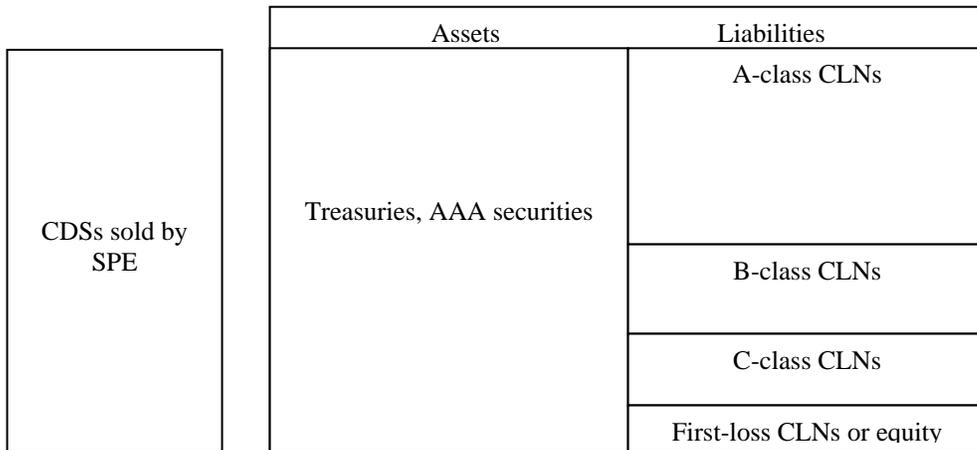
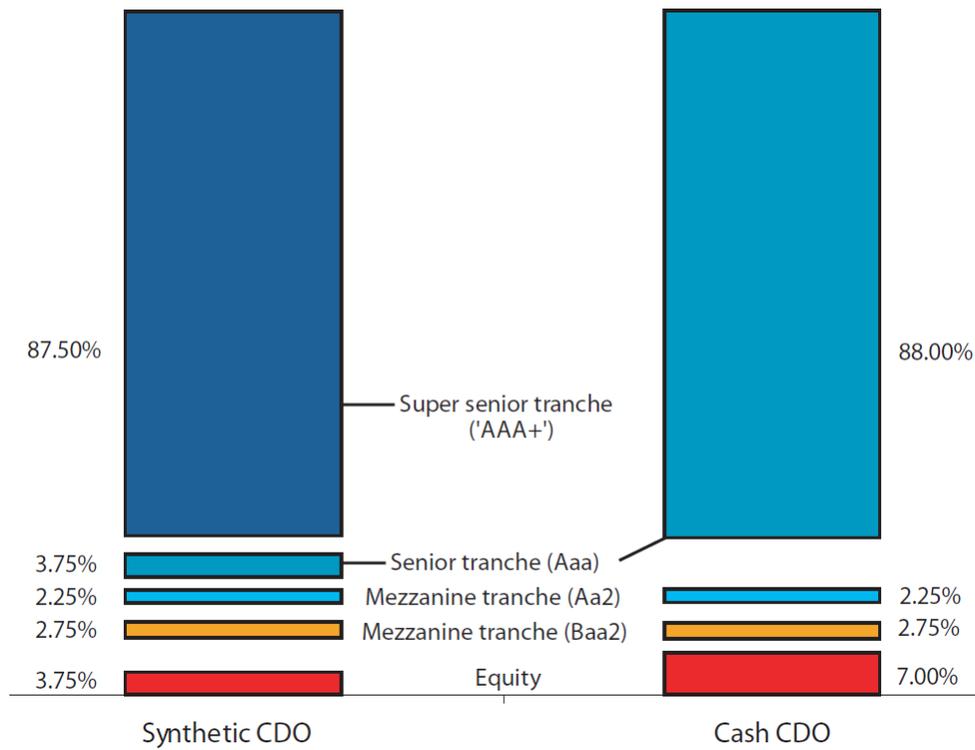


Figure 23. Tranching of a Typical Synthetic CDO Deal



Source: Moore (2004)

Figure 24. SPE Structure (in bold) in Single Tranche CDO Synthetic Deal Established for Balance-sheet Purposes (based on Clark [2007], Goldman [2008])

Pool of reference selected by the originator	“Super-Senior” CDS sold by an OECD bank to originator	Treasuries, AAA securities	Unfunded super-Senior tranche
	“Junior” CDS sold by SPE to originator		B-class CLNs
	Swap subordination	Equity	

Figure 25. SPE Structure (in bold) in Multi-tranche CDO Synthetic Deal (in bold) Established for Arbitrage Purposes (based on Renault [2007])

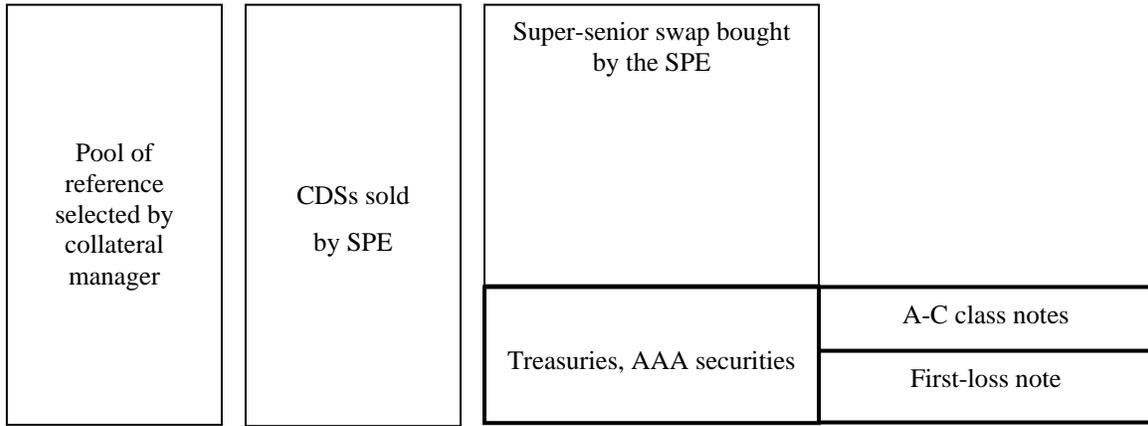
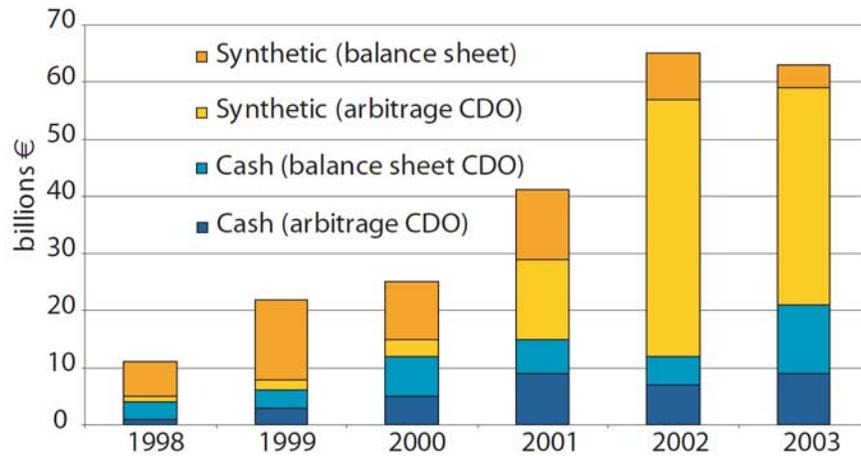
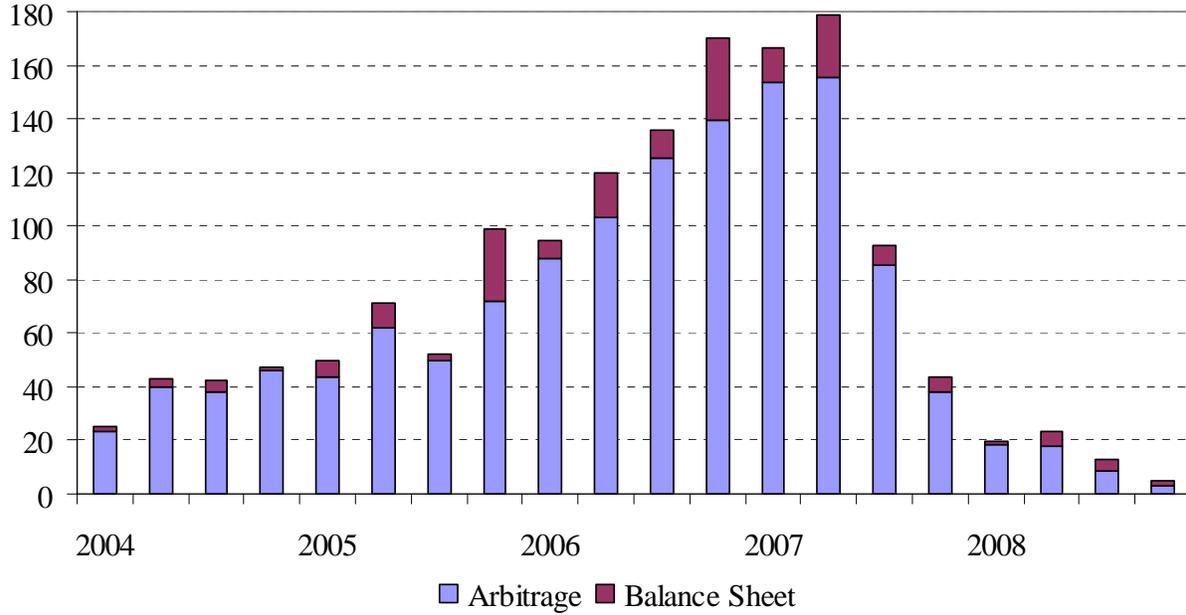


Figure 26. Global Issuance of CDOs by Motives, 1998–2003



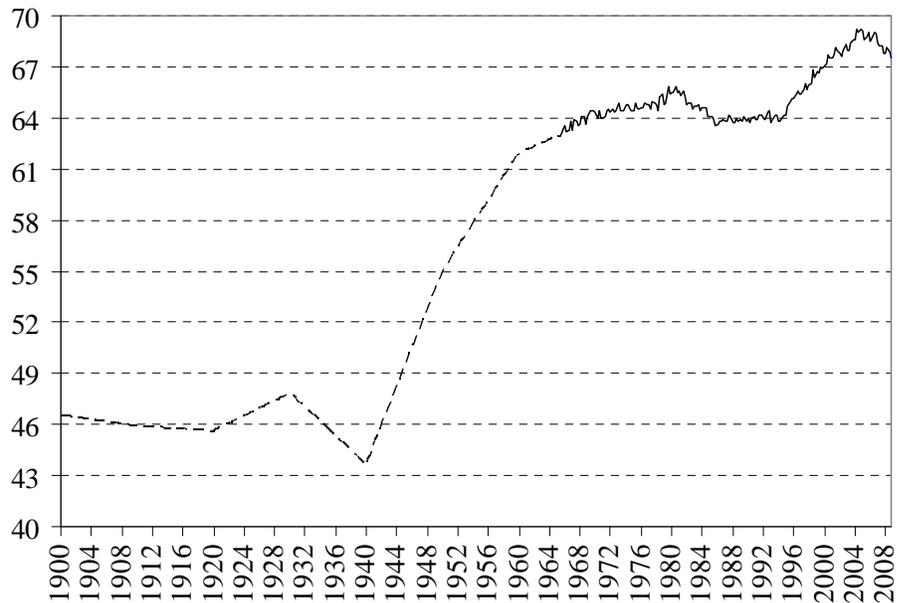
Source: Lehman Brothers in Moore (2004)

Figure 27. Global Issuance of CDOs by Motives, 2004–2008 (Billions of Dollars)



Source: SIFMA

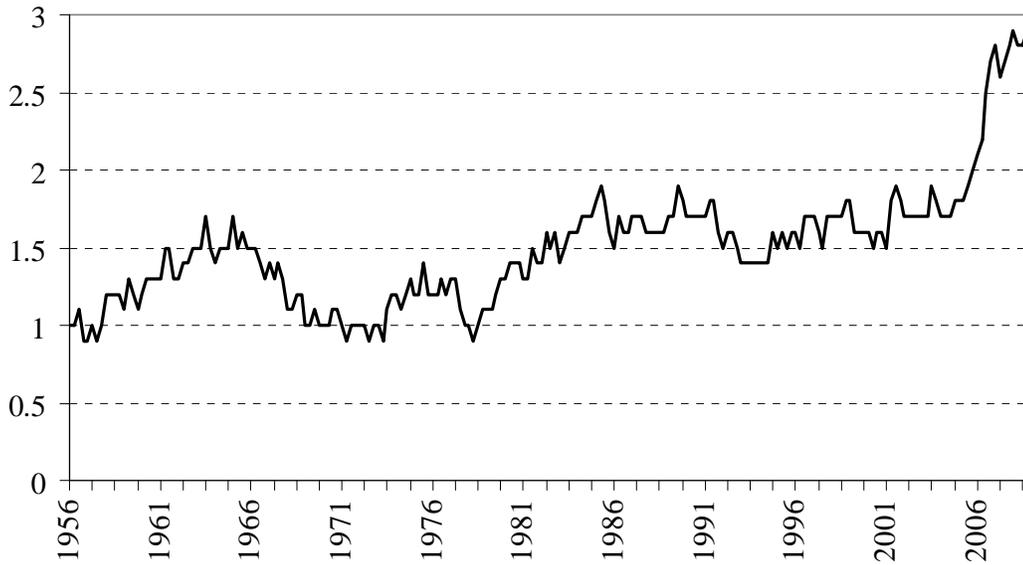
Figure 28. Homeownership Rate, 1900–2008



Source: Census Bureau.

Note: Decennial data from 1900 to 1960, quarterly data from 1965. Homeownership rate is computed by dividing the number of owner-occupied housing units by the number of occupied housing units or households. A housing unit is owner-occupied if the owner or co-owner lives in the unit, even if it is mortgaged or not fully paid for.

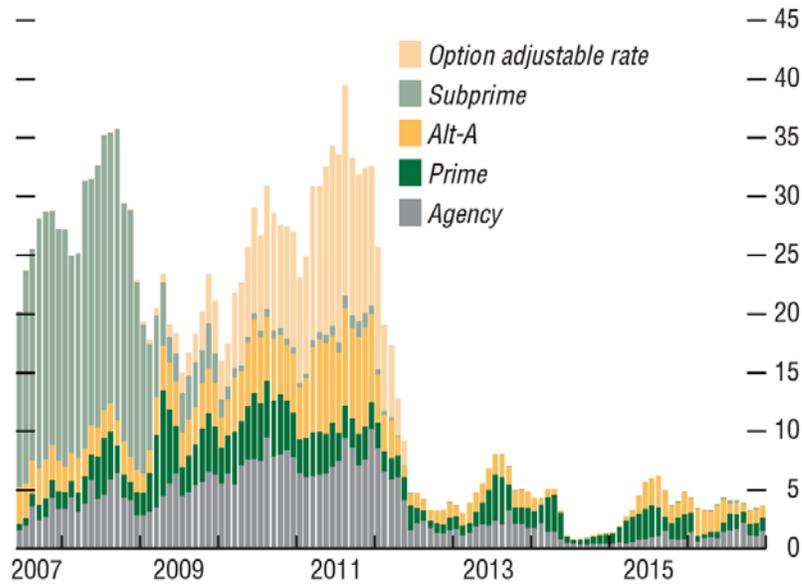
Figure 29. Quarterly Homeowner Vacancy Rate, 1956–2008



Source: Census Bureau

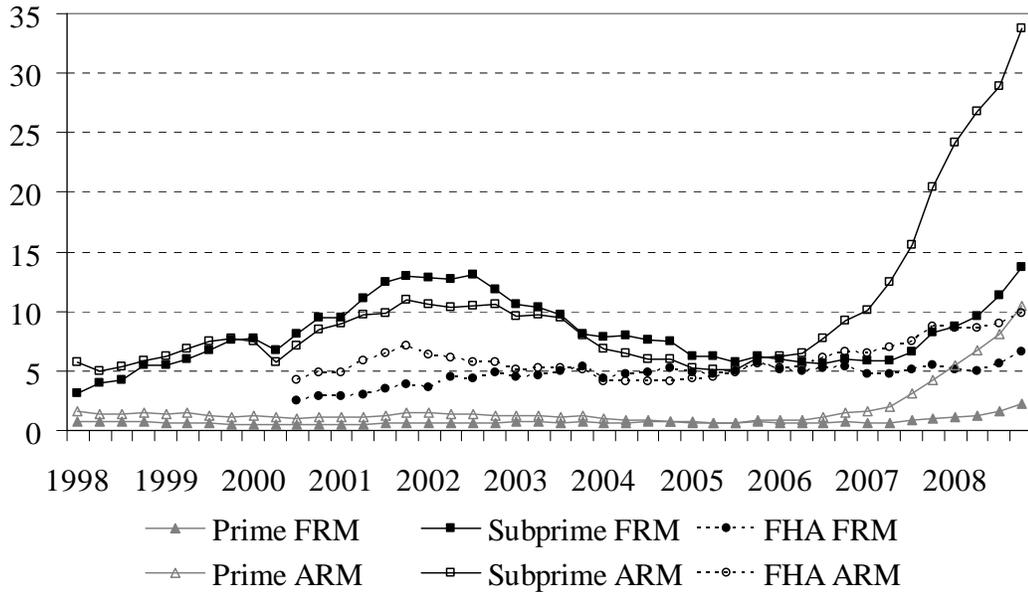
Note: The homeowner vacancy rate is the proportion of the homeowner inventory that is vacant for sale. It is computed by dividing the number of vacant units for sale only by the sum of the owner-occupied units and the number of vacant units that are for sale only.

Figure 30. Monthly Mortgage Rate Reset



Source: Credit Suisse in International Monetary Fund (2007: 8)

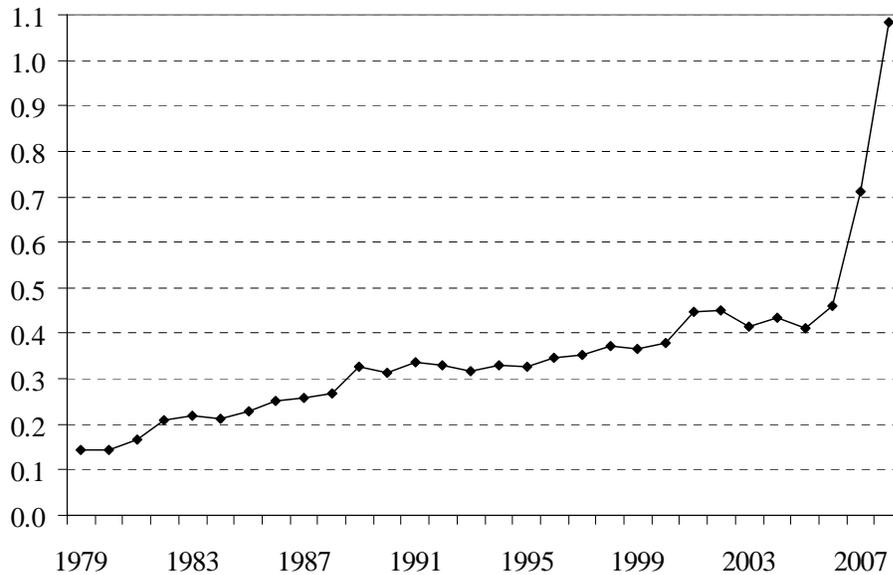
Figure 31. Percentage of Single-Family Mortgages in Serious Delinquency



Source: National Delinquency Survey (Mortgage Banker Association).

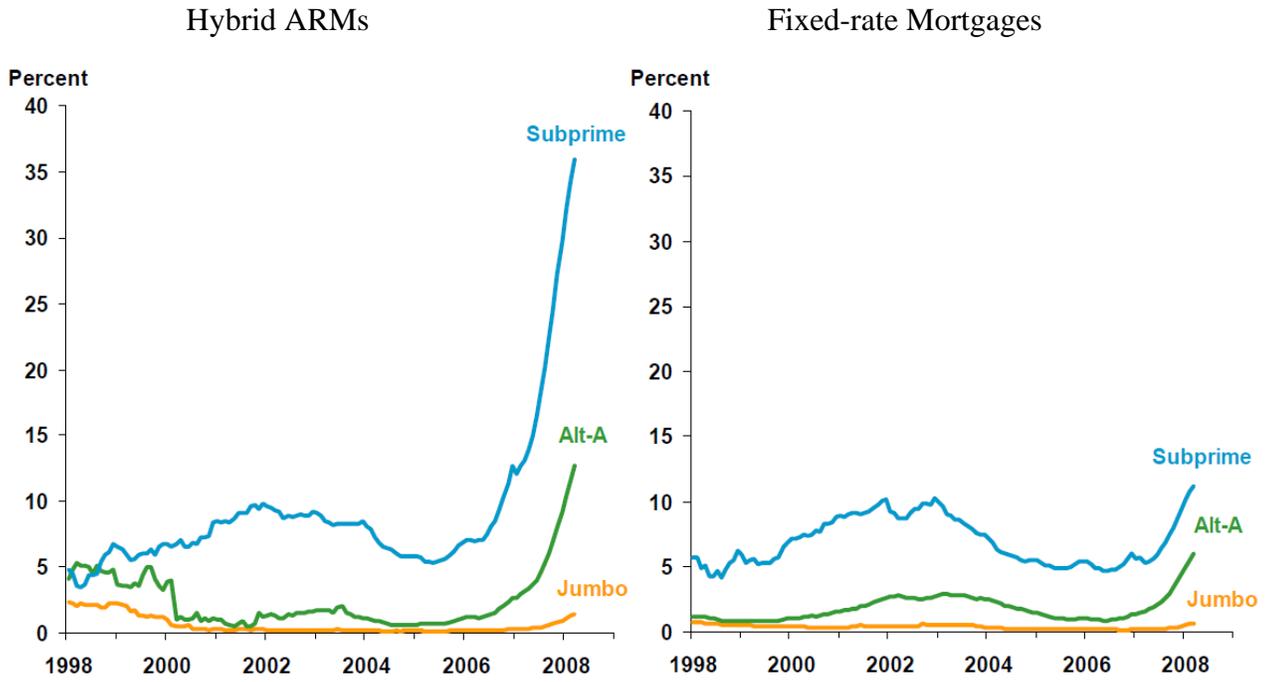
Note: Serious delinquency means that debt service payments are 90 days past due or in the process of foreclosure.

Figure 32. Rate of Foreclosure Started, All Mortgages



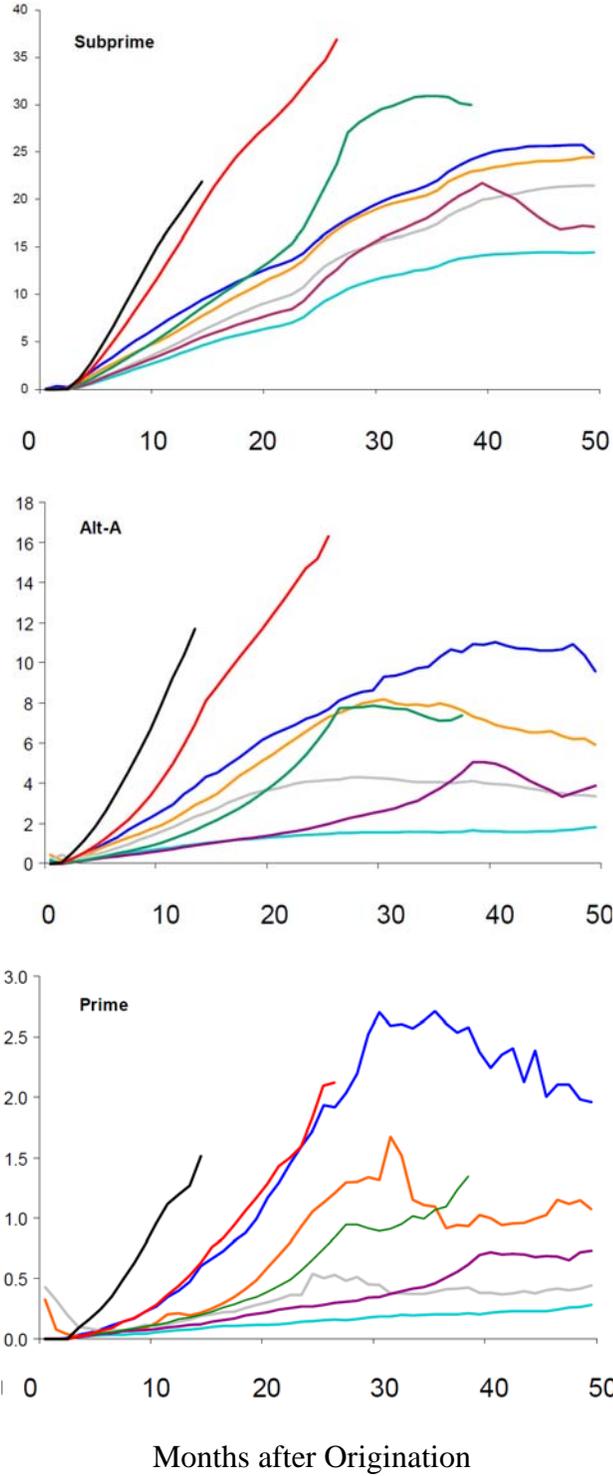
Source: MBA National Delinquency Survey. Rate of foreclosure started refers to the percentage of loans for which a foreclosure has been initiated during the quarter.

Figure 33. Delinquency on Traditional and Toxic Mortgages



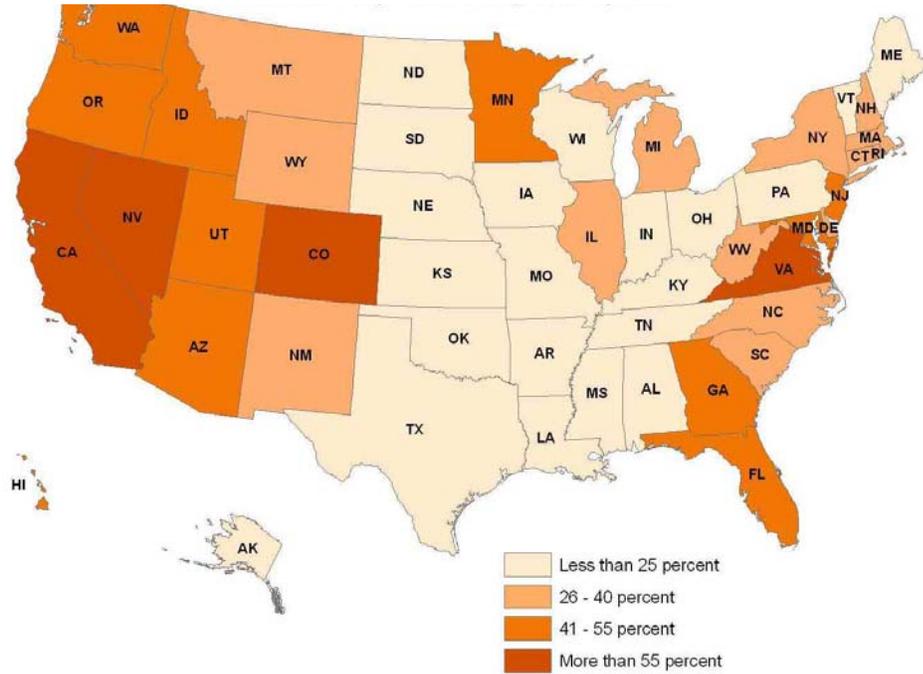
Source: Citigroup in FHLMC (2008)

Figure 34. U.S. Mortgage Delinquencies by Vintage Year (60+ Day Delinquency, in Percent of Original Balance)



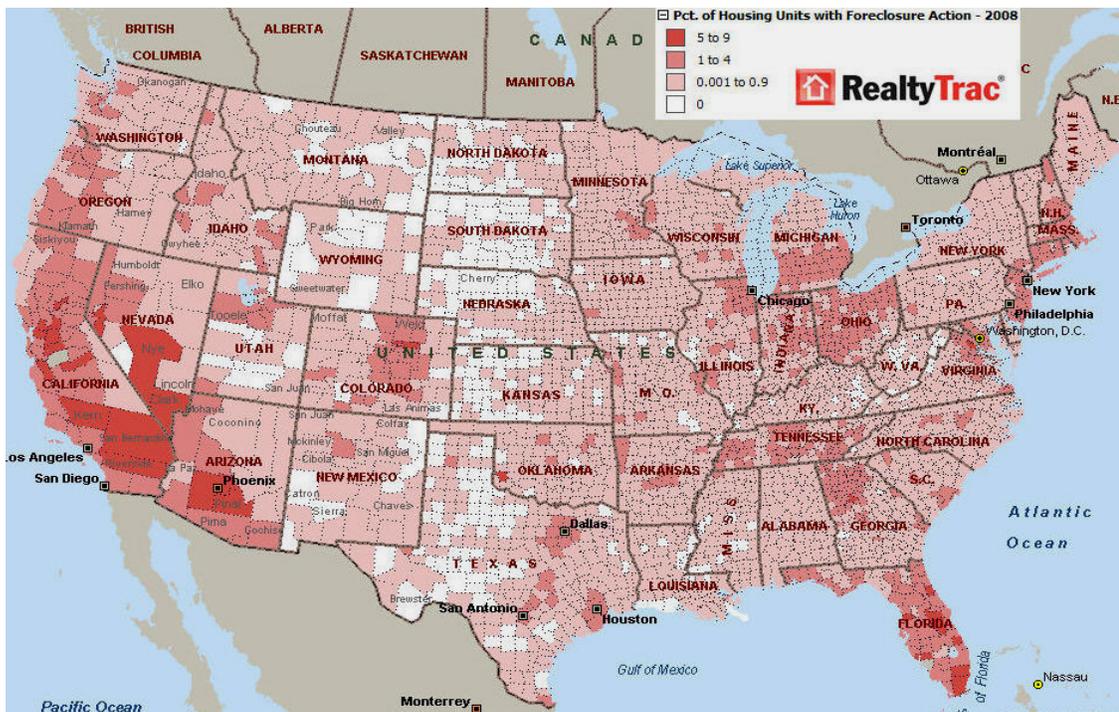
Sources: Merrill Lynch and LoanPerformance in International Monetary Fund (2008b: 6)

Figure 37. Share of Nonprime Mortgage Origination that Are Interest-only or Have Payment Options (Fourth Quarter 2005)



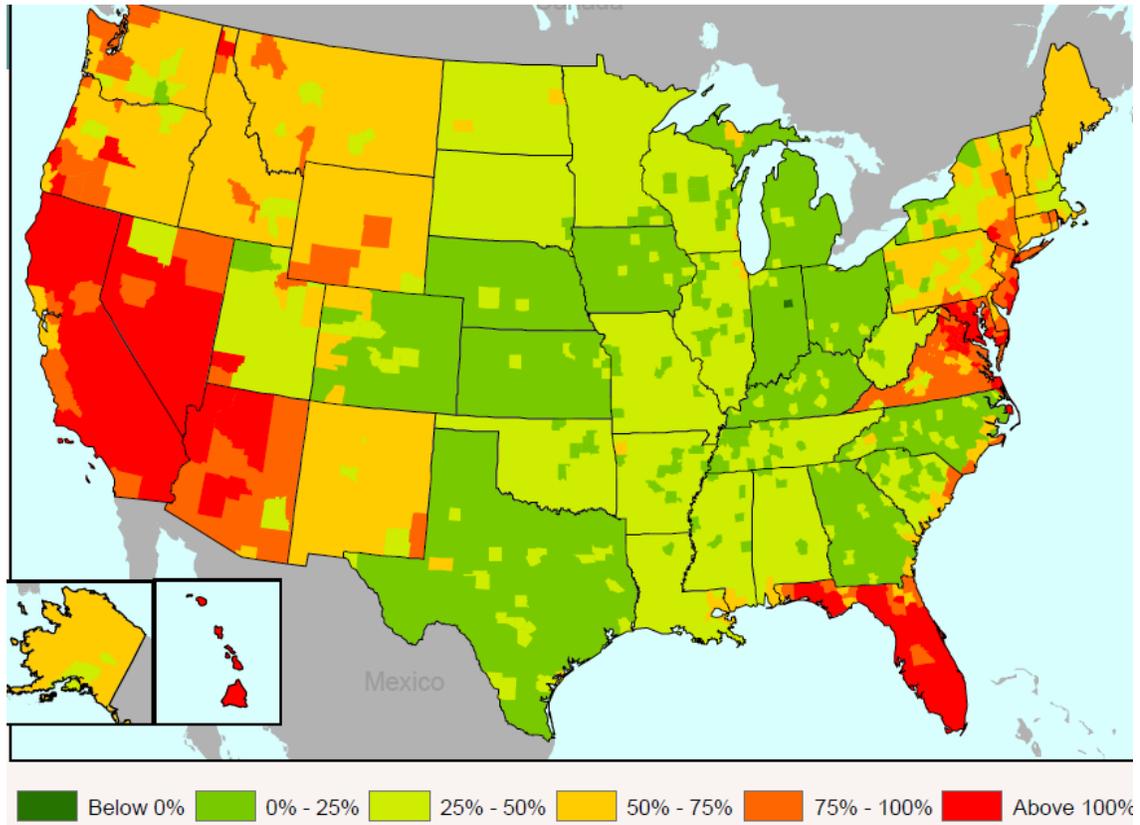
Sources: Office of Federal Housing Enterprise Oversight, LoanPerformance in Olson (2005)

Figure 38. Foreclosure Rate by Metropolitan Statistical Areas in 2008



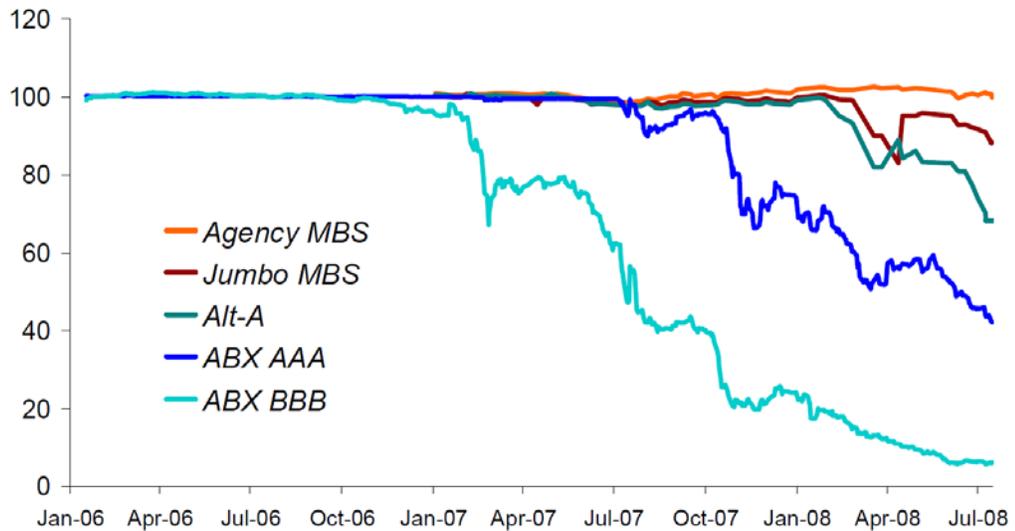
Source: Realtytrac

Figure 39. Change in Home Price (2001Q1 to 2006Q3)



Source: FNMA in Thompson (2007)

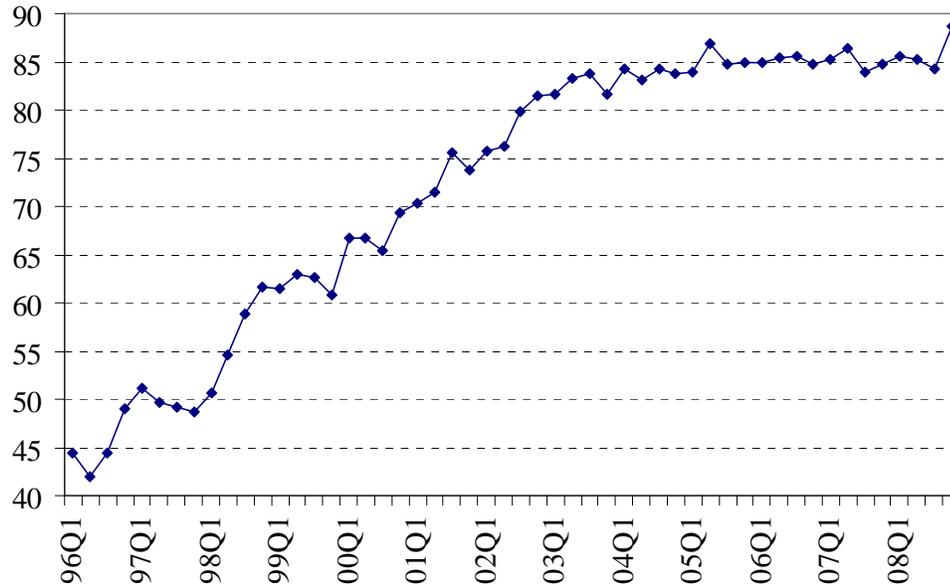
Figure 40. Prices Indexes of U.S. Mortgage-Related Securities (100 = par value)



Sources: JPMorgan Chase & Co. and Lehman Brothers in International Monetary Fund (2008b: 6)

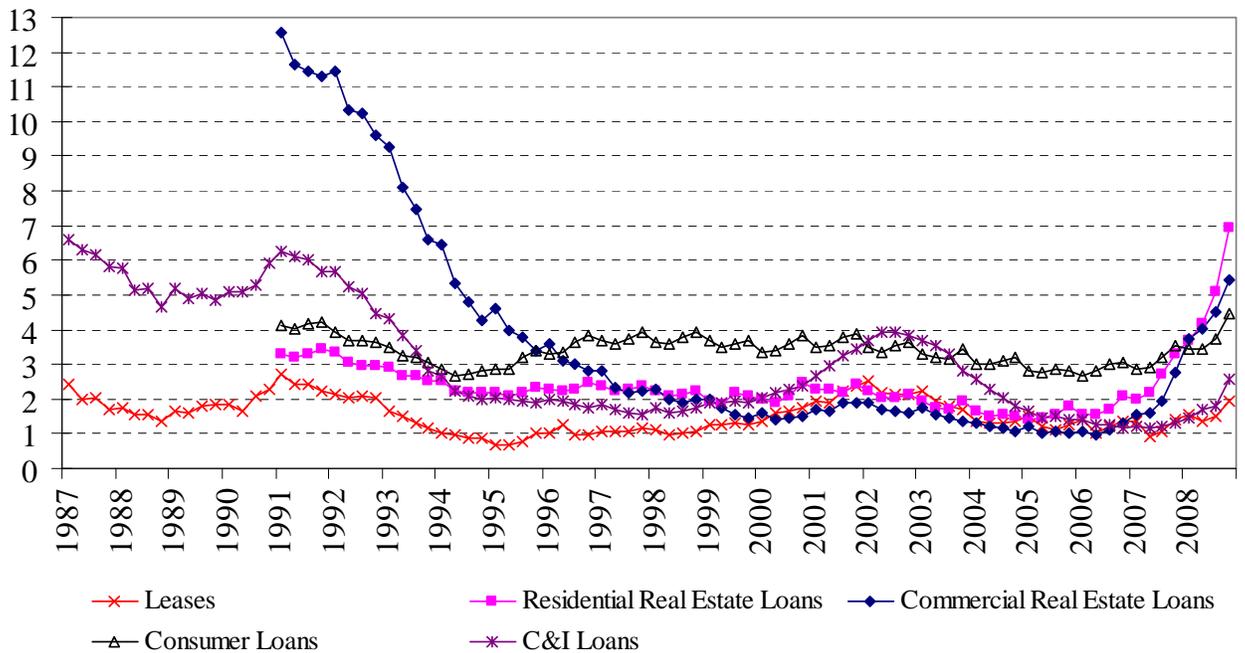
Note: ABX = index of credit default swaps on mortgage-related asset-backed securities.

Figure 41. Percentage of Gross Exposures Eliminated through Bilateral Netting (All Commercial Banks with Derivatives)



Source: Office of the Comptroller of the Currency (2009)

Figure 42. Delinquency Rates



Source: Federal Reserve Board

Table 1. Typical Collateral Composition of ABS CDOs (Percent)

	High grade ABS CDO	Mezzanine ABS CDO
Subprime RMBS	50	77
Other RMBS	25	12
CDO	19	6
Other	6	5

Source: Citigroup in Bank of International Settlement (2008: 5)

Table 2. Market Participants in Credit Derivatives, 2004 and 2006 (in Percent of Total)

	Protection Buyers		Protection Sellers		Net Protection Seller (+) or Buyer (-)	
	2004	2006	2004	2006	2004	2006
Banks	67	59	54	43	-13	-16
Hedge funds	16	28	15	31	-1	+3
Pension funds	3	2	4	4	+1	+2
Insurance	7	6	20	17	+13	+11
Corporations	3	2	2	1	-1	-1
Mutual funds	3	2	4	3	+1	+1
Other	1	1	1	1	0	0

Source: British Bankers' Association in International Monetary Fund (2008a)

REFERENCES

- Adelson, A. 2004. "CDOs in Plain English." Nomura Fixed Income Research, September 2004.
- Bayot, J. 2003. "Interest-Only Plans Catch on as Curb to Mortgage Payments." *New York Times*, August 16. Accessed February 20, 2008 at:
<http://query.nytimes.com/gst/fullpage.html?res=9C05E4DF1530F935A2575BC0A9659C8B63>
- Black, W.K. 2005. *The Best Way to Rob a Bank Is to Own One: How Corporate Executives and Politicians Looted the S&L Industry*. Austin: University of Texas Press.
- Blundell-Wignall, A., P. Atkinson, and S.H. Lee. 2008. "The Current Financial Crisis: Causes and Policy Issues." *OECD Financial Market Trends* 95(2): 1–21.
- Cargill, T.F., and G.G. Garcia. 1982. *Financial Deregulation and Monetary Control: Historical Perspective and Impact of the 1980 Act*. Stanford: Hoover Institution Press.
- Chui, S. 2006. "Nontraditional Mortgages: Appealing but Misunderstood." Federal Reserve Bank of Chicago *Profitwise News and Views* December: 2–11.
- Clark, E.H. 2007. "U.S. Developments in Synthetic Securitization: Rampant Growth and the Spectre of SEC Regulation." in J.J. de Vries Robbé and P.U. Ali (eds.), *Expansion and Diversification of Securitization, Yearbook 2007*. London: Kluwer Law International.
- Congressional Budget Office. 2008. "Policy Options for the Housing and Financial Markets." Congressional Budget Office Paper, April. Accessed December 26, 2008 at:
http://www.cbo.gov/ftpdocs/90xx/doc9078/04-11-Housing_with_Letter.pdf.
- Counterparty Risk Management Policy Group III. 2008. *Containing Systemic Risk: The Road to Reform*. New York: Counterparty Risk Management Policy Group III.
- Creswell, J. 2007. "Web Help for Getting Mortgage the Criminal Way." *New York Times*, June 16. Accessed December 10, 2008 at:
<http://www.nytimes.com/2007/06/16/technology/16fraud.html?fta=y>.
- D'Arista, J.W. 1994. *The Evolution of U.S. Finance: Federal Reserve Monetary Policy: 1915–1935*. New York: ME Sharpe.
- Das, S. 2006. *Traders, Guns and Money*. New York: Prentice Hall.

- Daussy, L. 2008. "Un Salarié de BNP Paribas se Suicide dans son Agence." *Le Figaro*, March 4. Accessed February 3 2008 at: <http://www.lefigaro.fr/actualites/2008/03/04/01001-20080304ARTFIG00452-un-salarie-de-bnp-paribas-se-suicide-dans-son-agence.php>.
- Der Hovanesian, M. 2008. "A Smart Idea Spoiled." *BusinessWeek*, July 7.
- Department of Labor. 2000a. "Proposed Amendment to Prohibited Transaction Exemption (PTE) 97-34 Involving Bear, Stearns & Co. Inc., Prudential Securities Incorporated, et al., (D-10829); Notice." *Federal Register* 65(164): 51454-51494.
- . 2000b. "Amendment to Prohibited Transaction Exemption (PTE) 97-34 Involving Bear, Stearns & Co. Inc., Prudential Securities Incorporated, et al. (D-10829)." *Federal Register* 65(219): 67765-67774.
- Department of the Treasury. 2008. *The Department of the Treasury Blueprint for a Modernized Financial Regulatory Structure*. Washington, DC: The Department of the Treasury.
- El Boghdady, D., and S. Cohen. 2009. "The Growing Foreclosure Crisis." *Washington Post*, January 17. Accessed January 19, 2009 at: <http://www.washingtonpost.com/wp-dyn/content/article/2009/01/16/AR2009011604724.html>.
- Elul, R. 2006. "Residential Mortgage Default." Federal Reserve Bank of Philadelphia *Business Review* Third Quarter: 21-30.
- Fabozzi, F.J., and J. Dunlevy. 2002. "Non-agency MBS and Real Estate-Backed ABS." in F.J. Fabozzi (ed.), *The Handbook of Financial Instruments*. Hoboken, NJ: Wiley.
- Fair Isaac Corporation. 2007. *Understanding Your FICO Score*. Minneapolis: Fair Isaac Corporation.
- FHLMC. 2008. "Freddie Mac Update, December 2008." Presentation to investors. Accessed December 16, 2008 at: <http://www.freddiemac.com/investors/pdf/inv/investor-presentation.pdf>.
- FNMA. 2008a. "Fannie Mae 2008 Credit Supplement." Accessed December 16, 2008 at: http://www.fanniemae.com/media/pdf/newsreleases/2008_10K_credit_summary.pdf.
- . 2008b. *Quarterly Report to the Securities and Exchange Commission*. Washington, DC: FNMA. Accessed January 10, 2009 at: <http://www.fanniemae.com/ir/pdf/earnings/2008/q22008.pdf>.

Financial Stability Forum. 2008. *Report of the Financial Stability Forum on Enhancing Market and Institutional Resilience*. Basel: Financial Stability Forum.

Foust, D., and A. Pressman. 2008. "Credit Scores: Not-So-Magic Numbers." *Business Week*, February 18. Accessed December 16, 2008 at: http://www.businessweek.com/print/magazine/content/08_07/b4071038384407.htm.

Gramlich, R. 2000. "Subprime Lending And Predatory Lending." Remarks at the Federal Reserve Bank of Philadelphia, Community and Consumer Affairs Department Conference on Predatory Lending, Philadelphia, Pennsylvania, December 6.

———. 2004 "Subprime Mortgage Lending: Benefits, Costs, and Challenges." Remarks at the Financial Services Roundtable Annual Housing Policy Meeting, Chicago, Illinois, May 21.

Greenspan, A. 2008. "We Will Never Have a Perfect Model of Risk." *Financial Times*, March 17. Accessed December 10, 2008 at: <http://www.ft.com/cms/s/0/edbdbc6f6-f360-11dc-b6bc-0000779fd2ac.html>.

Greider, W. 1987. *Secrets of the Temple*. New York: Simon and Schuster.

Herbert, C.E., D.R. Haurin, S.S. Rosenthal, and M. Duda. 2005. *Homeownership Gaps Among Low-Income and Minority Borrowers and Neighborhoods*. U.S. Department of Housing and Urban Development, Office of Policy Development and Research. Cambridge: Abt Associates, Inc.

International Monetary Fund. 2007. *Financial Market Turbulence: Causes, Consequences, and Policies*. International Monetary Fund's *Global Financial Stability Report*, October. Washington, DC: International Monetary Fund.

———. 2008a. *Containing Systemic Risks and Restoring Financial Soundness*. International Monetary Fund's *Global Financial Stability Report*, April. Washington, DC: International Monetary Fund.

———. 2008b. *Financial Stress and Deleveraging: Macrofinancial Implications and Policy* (Summary Version). International Monetary Fund's *Global Financial Stability Report*, October. Washington, DC: International Monetary Fund.

———. 2009. *Responding to the Financial Crisis and Measuring Systemic Risks* (Summary Version). International Monetary Fund's *Global Financial Stability Report*, April. Washington, DC: International Monetary Fund.

- Kothari, V. 2006. *Securitization: The Financial Instrument of the Future*. Hoboken, NJ: Wiley.
- Kregel, J.A. 1998. *The Past and Future of Banks*. Quaderni di Ricerche, No. 21. Rome: Ente Luigi Einaudi.
- . 2006. “Can The Basel Revised Framework Succeed Where Basel I Failed?” Remarks Prepared for the International Seminar Global Finance and Strategies of Developing Countries Organized by the Institute of Economics University of Campinas, March 13–14, 2006.
- . 2008. “Minsky’s Cushions of Safety: Systemic Risk and the Crisis in the U.S. Subprime Mortgage Market.” Public Policy Brief No. 93/2008. Annandale-on-Hudson, NY: The Levy Economics Institute of Bard College.
- Lui, D. 2005. “Interest-only ARMs.” in F.J. Fabozzi (ed.), *The Handbook of Mortgage-Backed Securities*. Hoboken, NJ: Wiley.
- Morgenson, G. 2008. “Behind Insurer’s Crisis, Blind Eye to a Web of Risk.” *New York Times*, September 27. Accessed November 10, 2008 at: <http://www.nytimes.com/2008/09/28/business/28melt.html>.
- Minsky, H.P. 1975. “Suggestions for a Cash Flow-oriented Bank Examination.” in Federal Reserve Bank of Chicago (ed.) *Proceedings of a Conference on Bank Structure and Competition*. Chicago: Federal Reserve Bank of Chicago.
- . 1981. “Financial Markets and Economic Instability, 1965–1980.” *Nebraska Journal of Economics and Business* 20(4): 5–16.
- . 1986a. *Stabilizing an Unstable Economy*. New Haven, CT: Yale University Press.
- . 1986b. “Global Consequences of Financial Deregulation.” *Marcus Wallenberg Papers on International Finance* 2(1): 1–19.
- Mishkin, F.S. 1991. “Asymmetric Information and Financial Crises: A Historical Perspective.” in R.G. Hubbard (ed.), *Financial Markets and Financial Crises*. Chicago: University of Chicago Press.
- Nash, N.C. 1987. “Four Years of Overseeing the Troubled Thrifts.” *New York Times*, July 15. Accessed October 3, 2008 at: <http://query.nytimes.com/gst/fullpage.html?res=9B0DE0DD173DF936A25754C0A961948260&sec=&spon>.

- New York Times. 2009. "Adding up the Government's Total Bailout Tab." *New York Times*, February 4. Accessed April 15, 2009 at:
<http://www.nytimes.com/interactive/2009/02/04/business/20090205-bailout-totals-graphic.html>.
- Office of the Comptroller of the Currency. 2009. *OCC's Quarterly Report on Bank Trading and Derivatives Activities*, Fourth Quarter 2008. Washington, DC: Office of the Comptroller of the Currency. Available at: <http://www.occ.treas.gov/ftp/release/2009-34a.pdf>.
- Olson, J. 2005. "Understanding Homeowners at Risk of Foreclosure in Nevada." Presentation made at the conference on *Preserving Homeownership – Preserving Communities*. Accessed October 31, 2008 at:
http://www.frbsf.org/community/issues/assets/preservation/resources/Olson_presentation.pdf.
- Papadimitriou, D., and L.R. Wray. 2008. "Time To Bail Out: Alternatives to the Bush-Paulson Plan." Policy Note 2008/6. Annandale-on-Hudson, NY: The Levy Economics Institute of Bard College.
- Pendley, M.D., G. Costello, and M. Kelsh. 2007. "The Impact of Poor Underwriting Practices and Fraud in Subprime RMBS Performance." FitchRating U.S. Residential Mortgage Special Report, November 28.
- Sinai, A. 1976. "Credit Crunches—An Analysis of the Postwar Experience." in O. Eckstein (ed.), *Parameters and Policies in the U.S. Economy*. Amsterdam: North-Holland Publishing Co.
- Streitfeld, D., and G. Morgenson. 2008. "Building Flawed American Dreams." *New York Times*, October 18.
- Thompson, B. 2007. Presentation for the *San Diego Housing Seminar*, May 2. Accessed November 15, 2008 at:
http://www.housingseminars.com/presentations/San_Diego_5_207.pdf.
- Tymoigne, E. 2007. "A Hard-Nosed Look at Worsening U.S. Household Finance." *Challenge* 50(4): 88–111.
- . 2009a. *Central Banking, Asset Prices and Financial Fragility*. London: Routledge.
- . 2009b. "A Critical Assessment of Seven Reports on Financial Reform: A Minskian Perspective." Forthcoming. Annandale-on-Hudson, NY: The Levy Economics Institute of Bard College.

- _____. 2010. "The U.S. Mortgage Crisis: Subprime or Systemic?" Forthcoming in G.N. Gregoriou (ed.), *Banking Crisis*. London: Taylor and Francis.
- U.S. House of Representatives. 2008. *The Financial Crisis and the Role of Federal Regulators*. Preliminary Transcript of the Hearing of the Committee on Oversight and Government Reform held Thursday, October 23. Accessed December 18, 2008 at: <http://oversight.house.gov/documents/20081024163819.pdf>.
- Veblen, T.B. 1904. *The Theory of Business Enterprise*. New York: Charles Scribner's Sons.
- Whalen, C.J. 2008. "Understanding the Credit Crunch as a Minsky Moment." *Challenge* 51(1): 91–109.
- Whetten, M. 2004. "CDO/CDS Update 10/18/04." Nomura Fixed Income Research, October.
- Wolfson, M.H. 1994. *Financial Crises*, Second Edition. Armonk, NY: M.E. Sharpe.
- Wray, L.R. 2006. "Can Basel II Enhance Financial Stability? A Pessimistic View." Public Policy Brief No. 84/2006. Annandale-on-Hudson, NY: The Levy Economics Institute of Bard College.
- _____. 2008. "Lessons from the Subprime Meltdown." *Challenge* 51(2): 40–68.
- Wray, L.R., and Tymoigne, E. 2008. "Macroeconomics Meets Hyman P. Minsky: The Financial Theory of Investment." Working Paper No. 543. Annandale-on-Hudson, NY: The Levy Economics Institute of Bard College. (Forthcoming in Fontana and Setterfield (eds.) *Macroeconomic Theory and Macroeconomic Pedagogy*. Basingstoke: Palgrave Macmillan.)
- Zelman, I.L. 2007. "Mortgage Liquidity du Jour: Underestimated No More." Credit Suisse Equity Research, March.