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# Lessons from the Subprime Meltdown

by

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**ABSTRACT**

This paper uses Hyman P. Minsky's approach to analyze the current international financial crisis that was initiated by problems in the U.S. real estate market. In a 1987 manuscript, Minsky had already recognized the importance of the trend toward securitization of home mortgages. This paper identifies the causes and consequences of the financial innovations that created the real estate boom and bust. It examines the role played by each of the key players—including brokers, appraisers, borrowers, securitizers, insurers, and regulators—in creating the crisis. Finally, it proposes short-run solutions to the current crisis, as well as longer-run policy to prevent "it" (a debt deflation) from happening again.

Keywords: Hyman Minsky; Financial Instability; Mortgage-backed Securities; Subprime Mortgages

JEL Classifications: E12, E32, E44, E58, E63

## PART I: THE MINSKY MOMENT: CROSSING THE RUBICON

> *"Over a protracted period of good times, capitalist economies tend to move from a financial structure dominated by hedge finance units to a structure in which there is a large weight to units engaged in speculative and Ponzi finance" (Minsky 1992).*

Many recent writings on the subprime meltdown have referred to the work of the late Hyman Minsky, probably the most astute observer of the financial system of the past century. Some have even called the current situation a "Minsky moment" (Whalen 2007, Magnus 2007). This paper will argue that these commentators are correct—Minsky's writings can shed a lot of light on the current problems. However, most have not delved deeply enough into Minsky's insights. Indeed, exactly twenty years ago, Minsky wrote a prescient piece on securitization that can help us to analyze the evolution of financial markets that brought us to the present crisis.

Minsky always insisted that there are two essential propositions of his "financial instability hypothesis." The first is that there are two financing "regimes"—one that is consistent with stability and the other in which the economy is subject to instability. The second proposition is that "stability is destabilizing," so that endogenous processes will tend to move a stable system toward fragility. While Minsky is best known for his analysis of the downturn and crisis, he argued that the strongest force in a modern capitalist economy operates in the other direction—toward an unconstrained speculative boom. The current crisis is a natural outcome of these processes—an unsustainable explosion of real estate prices, mortgage debt and leveraged positions in collateralized securities. Unlike some popular explanations of the causes of the meltdown, Minsky would not blame "irrational exuberance" or "manias" or "bubbles." Those who had been caught up in the boom behaved "rationally," at least according to the "model of the model" they had developed to guide their behavior. That model included the prospective course of asset prices, future income, behavior of policy-makers, and ability to hedge or shift risks onto others. It is only in retrospect that we can see the boom for what it was—mass delusion propagated in part by policy makers and those with vested interests who should have known better. However, a large part of the blame must be laid on the relative stability experienced over the past couple of decades—even if that is a rather unsatisfying

place to lay blame as no one would have preferred greater instability in order to avoid the current "Minsky moment." But the tranquility that made the boom possible also brought us to the current unstable situation.

The question that Minsky would ask is whether the current environment is one conducive to "it" happening again—that is whether we are likely to fall into a debt deflation process that results in a great depression. It is likely that the current regulatory system with a "big government" and "big bank" will be sufficient to contain the repercussions. However, given the substantial human, social, and economic costs of a Fisher-type snowball of defaults, it is worth considering policy that might constrain the impulse toward asset price deflation. Further, it is time to rethink the New Deal reforms to create new institutional constraints to prevent "it" from happening again. This paper will conclude with some general recommendations for directions that policy might take.

## 1. Origins of the Crisis

> *"What was recently seen as 'creative' and 'innovative' democratization of credit is now viewed as misguided and culpable bungling or worse." Alex Pollock, Testimony before the Subcommittee on Financial Institutions and Consumer Credit, Committee on Financial Services, U.S. House of Representatives, Hearing on Subprime and Predatory Lending, March 27, 2007*

> *"Sentiment just keeps getting more and more bleak. This week it's been all about fear overtaking greed." James W. Paulson, quoted in Michael M. Grynbaum, "Stocks Plummet on 'Ugly Week' for Investors," New York Times, November 22, 2007.*

Irrational exuberance? No, the seeds of the current mortgage crisis were sown in the 1951 Treasury-Fed "Accord" that freed the central bank from its commitment to keep interest rates low. Henceforth, the Fed could use interest rate hikes to reduce perceived inflation pressures. Fortunately, rate hikes were relatively moderate and short-lived for the following two decades. Each rate hike caused problems in the commercial banking and thrift sectors because they were subject to Regulation Q interest rate ceilings, thus suffered "disintermediation" (deposit withdrawals) when market rates rose above legislated deposit rates. At the same time, usury laws throughout the nation also placed ceilings on lending rates, so the Fed could engineer "credit crunches" by pushing market

rates toward the maximum permitted. In addition, other rules and regulations that dated to the New Deal financial reforms also constrained practice in an attempt to preserve safety and soundness. However, as Minsky argued long ago, financial institutions responded to each tight money episode by innovating, creating new practices and instruments that would evade constraints to make the supply of credit more elastic. In this manner, as time passed, the upside tendency toward speculative booms became ever more difficult to attenuate.

In addition, the Fed and elected policy makers gradually relaxed constraints, often in response to private initiative. New practices were validated and sometimes even encouraged to allow heavily regulated banks and thrifts to compete with lightly controlled markets. Thrift ownership rules were relaxed in the early 1970s, opening the way to the abuses that decimated the whole industry in the 1980s. The development of secondary markets in mortgages in the early 1980s was a reaction to the high interest rate monetarist experiment used by Volcker to fight stagflation. The Glass Steagall act that had separated commercial and investment banking was repealed in 1999, allowing commercial banks to engage in a wider range of practices so that they could better compete with their relatively unregulated Wall Street competitors. As Kregel (2007a) notes, in 1999 Congress approved the Gramm-Leach-Bliley Bank Reform Act according to which "banks of all sizes gained the ability to engage in a much wider range of financial activities and to provide a full range of products and services without regulatory restraint"[1] (Kregel 2007a). As Minsky argued, at each step, deregulation allowed increasingly risky innovations that made the system more vulnerable.

[1] According to Kregel (2007a), the Gramm-Leach-Bliley Bank Reform Act

- allowed banks to expand the range of their activities into areas previously preserved for investment banks, and allowed investment banks to expand their "commercial" banking activities.
- amended the Bank Holding Company Act of 1956 to permit the holding company owners of commercial banks to engage in any type of financial activity.
- allowed banks to own subsidiaries engaged in financial activities that were off-limits to commercial banks.

These changes allowed Countrywide Financial Corporation to own: a bank (overseen by the OTS); a broker-dealer trading US government securities and mortgage-backed securities; a mortgage servicing firm; a real estate closing services company; an insurance company; and three special-purpose vehicles to issue short-term commercial paper backed by Countrywide mortgages. (Kregel 2007a)

Finally, it must be emphasized that deregulation and legal recognition of new practices were not, by themselves, sufficient to bring us to the present precipice. If these innovations had led to excessively risky behavior that generated huge losses, financial institutions would have been reluctant to retain them. As Minsky always argued, by preventing "it" (a debt deflation on the order of the 1930s collapse) from happening again, new practices and instruments were validated. The remarkable thing about the post-war period is the absence of depressions. While recessions occur with regularity, they are constrained; while financial crises arise from time-to-time, the fall-out is contained. This is due in part to the various reforms that date to the New Deal, but also to countercyclical movement of the "Big Government" budget, to lender of last resort activity of the "Big Bank" Fed, and to periodic bail-outs arranged by the Fed, by the government sponsored enterprises (GSEs), or by Congress.

In other words, irrational exuberance is just the end result of long-term policy-induced, and in turn policy-validated, financial innovations that stretched liquidity and enabled prices of real estate and of equity to reach unjustified and unsustainable levels. Blaming the "bubble" for the current crisis is rather like blaming the car for an accident—when we ought to take a good long look at the driver, and at the bartender who kept the whiskey flowing all evening before helping the drunk to his car after last call. To be sure, there isn't anything necessarily wrong with driving or with drinking, but separation of functions can be prudent. Further, the bartender bears some responsibility for maintaining that separation. Unfortunately, those in charge of the financial system have for a very long time encouraged a blurring of the functions, mixing drinking and driving while arguing that the invisible hand guided by self interest can keep the car on course. The current wreck is a predictable result.

**2. Securitization**

> *"That which can be securitized will be securitized."*
>
> *"Securitization lowers the weight of that part of the financing structure which the Central Bank (Federal Reserve in the United States) is committed to protect."*
>
> *"The investment banker hires 'econometricians' or financial economists to demonstrate that the risks of default on interest and principle of some class of the*

*securities it proposes to issue are so small that these instruments deserve to have an investment rating that implies a low interest rate."*

Hyman Minsky, "Memo on Securitization," 1987.

Modern securitization of home mortgages began in the early 1980s, although as Robert Kuttner (2007) argues, securitized loans played a major role in the 1920s speculation that helped to bring on the 1930s collapse.[2] While securitization is usually presented as a technological innovation that came out of private sector initiative to spread risk, in reality—as Minsky (1987) argued--it was a response to policy initiated by Chairman Volcker in 1979. (See also Kuttner 2007) This was the infamous experiment in monetarism, during which the Fed purportedly targeted money growth to fight inflation. The fed funds rate was pushed above 20% in full recognition that this would kill the thrift industry—which was stuck with a portfolio of fixed rate mortgages paying as little as 6% (Wray 1994). The whole industry had been constructed in the aftermath of the Great Depression on the promise that short term rates would be kept low so that the "three-six-three" business model (pay 3% on deposits, earn 6% on mortgages, and hit the golf course at 3 p.m.) would profit while offering safe repositories for deposits and keeping homeownership affordable for most families. In the new policy regime, however, no financial institution could afford to be stuck with long-term fixed-rate mortgages. Hence, regulators and supervisors "freed" the savings and loans to pursue higher return, and riskier, activities—with quite predictable consequences.

There is no need to recount the sordid details of that fiasco. (Wray 1994; Black 2005) However, the long-term consequence was the recognition that the mortgage "market" had to change. In the beginning, it was the safer, conforming, loan that was securitized. Indeed, in the early 1990s there was wide spread fear that the trend to securitization would leave behind low income, minority, and female borrowers. With lower credit scores, and with housing in less desirable neighborhoods, these borrowers would not meet the standards required by markets for packaged mortgages. Minsky

[2] Lewis Ranieri at Salomon Brothers is credited with the creation of mortgage securities, bundling mortgages and issuing bonds with the mortgages serving as collateral and providing interest to pay the bond holders. Wall Street later began to divide the packages of mortgages into tranches, with holders of the safest tranches paid first, and with the holders of the riskiest tranches the last to be paid. In recent years, the search for higher returns drove the demand for the riskiest tranches as well as for riskier mortgage pools, such as securitized subprimes.

(1987) was one of the few commentators who understood the true potential of securitization, however. In principle, all mortgages could be packaged into a variety of risk classes, with differential pricing to cover risk. Investors could choose the desired risk-return trade-off. Thrifts and other regulated financial institutions would earn fee income for loan origination, for assessing risk, and for servicing the mortgages. Wall Street would place the collateralized debt obligations (CDOs), slicing and dicing to suit the needs of investors. Far from excluding borrowers of moderate means, securitization contributed to an apparent democratization of access to credit as homeownership rates rose to record levels over the coming decades.

Minsky (1987) argued that securitization reflected two additional developments. First, it was part and parcel of the globalization of finance, as securitization creates financial paper that is freed from national boundaries. German investors with no direct access to America's homeowners could buy a piece of the action in U.S. real estate markets. As Minsky was fond of pointing out, the unparalleled post-WWII depression-free expansion in the developed world (and even in much of the developing world) has created a global glut of managed money seeking returns. Packaged securities with risk weightings assigned by respected rating agencies were appealing for global investors trying to achieve the desired proportion of dollar-denominated assets. It would be no surprise to Minsky to find that the value of securitized American mortgages now exceeds the value of the market for federal government debt. The subprime problems thus quickly spread around the world—from a German bank (IKB) that required a bailout in July, to problems in BNP Paribas (France's biggest bank), and to a run on Northern Rock in the UK. Not even the central bank of China can escape losses!

The second development assessed by Minsky is the relative decline of the importance of banks (narrowly defined as financial institutions that accept deposits and make loans) in favor of "markets." (The bank share of all financial assets fell from around 50% in the 1950s to around 25% in the 1990s (Kregel 2007a). This development, itself, was encouraged by the experiment in monetarism (that decimated the regulated portion of the sector in favor of the relatively unregulated "markets"), but it was also spurred by continual erosion of the portion of the financial sphere that had been allocated by rules, regulations, and tradition to banks. The growth of competition on both sides of

banking business—checkable deposits at non-bank financial institutions that could pay market interest rates; and rise of the commercial paper market that allowed firms to bypass commercial banks—squeezed the profitability of banking. Minsky (1987) observed that banks appear to require a spread of about 450 basis points between interest rates earned on assets less that paid on liabilities. This covers the normal rate of return on capital, plus the required reserve "tax" imposed on banks (reserves are non-earning assets), and the costs of servicing customers. By contrast, financial markets can operate with much lower spreads precisely because they are exempt from required reserve ratios, regulated capital requirements, and much of the costs of relationship banking.

To restore profitability in the aftermath of monetarism, banks and thrifts would earn fee income for loan origination, but by moving the mortgages off their books they could escape reserve and capital requirements. They might continue to service the mortgages, earning additional fees. Investment banks would purchase the mortgages, securitize them, and sell them to investors. As Minsky (1987) argued, investment banks would pay ratings agencies to provide favorable ratings, and hire economists to develop models to demonstrate that interest earnings would more than compensate for risks. Later, Wall Street bankers would add other "credit enhancements" to the securities, such as large penalties for early payment and buy-back guarantees in the event of capital losses due to unexpectedly high delinquencies and foreclosures. As Minsky frequently said, the trick is to convince AAA borrowers to accept the terms appropriate to BBB borrowers, ensuring more than adequate returns to service the securities (the corollary is that profits can also be increased by convincing investors in lower-grade securities that the underlying BBB mortgages are just as safe as AAA mortgages—which is what the modelers were paid to do). However, Minsky was also quick to add that for many borrowers there is no interest rate that can compensate for risk, because the higher the interest rate charged, the greater the probability of default. For example, an appropriate spread for a BBB- borrower might be 400 basis points higher than that for the highest rated borrower, however, at the higher monthly payments required, that borrower would be sure to default so that no premium could compensate for the expected loss.

The problem is that the incentive structure in which mortgage originators operated generated conditions sure to create problems. In the aftermath of the equity market crash,

investors looked for alternative sources of profits. Low interest rate policy by Greenspan's Fed meant that traditional money markets could not offer adequate returns. Investors lusted for higher risks, and mortgage originators offered subprimes and other "affordability products" with ever lower underwriting standards. Brokers were richly rewarded for inducing borrowers to accept unfavorable terms, which increased the value of the securities. New and risky types of mortgages—hybrid ARMs (called "2/28" and "3/27") that offered low teaser rates for two or three years, with very high reset rates—were pushed.[3] As originators would not hold the mortgages, there was little reason to worry about ability to pay. Indeed, since banks, thrifts, and mortgage brokers relied on fee income, rather than interest, their incentive was to increase through-put, originating as many mortgages as possible. By design, these "affordability products" were not affordable—at the time of reset, the homeowner would need to refinance, generating early payment penalties and more fees for originators, securitizers, holders of securities, and all others in the home finance food chain. Risk raters essentially served as credit enhancers, certifying that prospective defaults on subprimes would be little different from those on conventional mortgages—so that the subprime-backed securities could receive the investment-grade rating required so that insurance funds and pension funds could buy them. Chairman Greenspan gave the maestro seal of approval to the practice, urging homebuyers to take on adjustable rate debt. Ironically, this shift to "markets" reduced the portion of the financial structure that the Fed is committed to regulate, supervise, and protect—something that was celebrated rather than feared. The fate of homeowners was

[3] According to an analysis of $2.5 trillion worth of subprime loans performed for the *Wall Street Journal*, most of those who obtained subprime loans would have qualified for better terms. For example, in 2005, 55% and in 2006 61% of subprime borrowers had credit scores high enough to obtain conventional loans. Because brokers were rewarded for persuading borrowers to take on higher interest rates than those they qualified for, there was strong pressure to avoid conventional loans with lower rates. For example, at New Century Financial Corporation, "brokers could earn a 'yield spread premium' equal to 2% of the loan amount—or $8,000 on a $400,000 loan—if a borrower's interest rate was an extra 1.25 percentage points higher" (Brooks and Simon 2007). According to New Century's rate sheet, spreads for similar borrowers with similar loans depended on documentation, with "full docs" typically paying interest rates 60 to well over 100 basis points less than "stated docs"—even with the same high credit scores. (Rate sheet available at http://online.wsj.com/public/resources/documents/tretro_SubPrime1107.html, accessed 12/3/2007). This may also explain why brokers accepted little documentation from borrowers.

sealed by bankruptcy "reform" that makes it virtually impossible to get out of mortgage debt—a very nice "credit enhancement."[4]

One other credit enhancement played an essential role—mortgage insurance and the ABX index. Some of the subprime loans are covered by mortgage insurance; more importantly, insurance was sold on the securities, themselves. Such insurers include MBIA of Armonk, NY (the world's largest insurer), AMBAC, FGIC Corp., and CFIG. The health of the insurers, in turn, is assessed by the ratings agencies (Moody's, Fitch) as well as by the ABX subprime index that tracks the cost of insuring against defaults on subprime securities. This index includes 20 asset-backed bonds with a low investment grade credit rating. If it declines, the cost of insurance rises. We will return to recent developments in the insurance market for subprimes below. However, it must be noted that without affordable insurance, and without high credit ratings for the insurers, themselves, the market for pools of mortgages would have been limited. As Richard and Gutscher (2007) write, "For more than 20 years, the safety of insurance has eased the way for elementary schools, Wall Street banks, and thousands of municipalities to sell debt with unquestioned credit quality." As the real estate market boomed, insurers "increased their guarantees of securities created from mortgages, including subprime loans to people with poor credit and home-equity loans" (Richard and Gutscher 2007). Insurers now guarantee $100 billion of securitized subprime mortgages—and many hundreds of billions of other bonds. For example, AMBAC guarantees more than half a trillion dollars worth of securities, and MBIA backs $652 billion of municipal and structured finance bonds. Insurance allowed the debts to gain the highest ratings—ensuring a deep market and low interest rate spreads (Richard and Gutscher 2007).

The combination of incentives to increase throughput, plus credit enhancements led to virtually no reluctance to purchase securities with the riskiest underlying debts. Ironically, while relationship banking had based loans on the relevant characteristics of

[4] However, in a ruling that has sent shockwaves through mortgage securities market, a federal judge in Ohio has thrown out 14 foreclosure cases ruling that mortgage investors had failed to prove they actually owned the properties they were trying to seize (Morgenson 2007c). Because the securities are so complex, and documentation lax, the judge found their claims to the properties weak. Josh Rosner, a mortgage securities specialist said "This is the miracle of not having securities mapped to the underlying loans. There is no repository for mortgage loans. I have heard of instances where the same loan is in two or three pools" (Morgenson 2007c). It is possible that this can prove to be one of the weak links in the slice-and-dice securities market.

the borrower (such as income, credit history, assets), the new arrangements appeared to offer a nearly infinite supply of impersonal mortgage credit with no need to evaluate borrower ability to repay. Instead, "quant models" based on historical data regarding default rates of purportedly similar borrowers would replace costly relationship banking, enhancing efficiencies and narrowing interest rate spreads (Kregel 2007b).

Markets responded in a manner that should have been anticipated. The subprime market bloomed, with increasingly risky instruments and practices. "Low doc" loans (less documentation required) evolved to "no docs" and to "liar loans" (borrowers were allowed and even encouraged to lie about income and other information relevant to the application process), and finally to "Ninja loans" (no income, no job, no assets). Risky mortgages were pooled and sliced into a variety of tranches to meet the risk-return profile desired by investors. Senior tranches would be paid first—if borrowers were able to service any part of the mortgage, the senior securities holders would receive income, making it appear that a security backed by exceedingly risky mortgages was actually quite safe. More junior, non-investment grade, tranches could be sold to hedge funds that would receive payments only if the senior securities were fully serviced. Because the historical experience of securities backed by nonconforming loans was very short, and because it (necessarily) coincided with an era of rapidly rising home prices, rating agencies felt justified in assigning low default probabilities on low docs, no docs, and NINJAs—warranting good prices for even the junior tranches. A nice virtuous cycle was created: such innovations expanded the supply of loans, fueled homebuying and drove up the value of real estate, which increased the size of loans required and justified rising leverage ratios (loan-to-value and loan-to-income) since homes could always be refinanced or sold later at higher prices if problems developed. The combination of low interest rates and rising real estate prices encouraged a speculative frenzy that would end only if rates rose or prices stopped rising. Of course, both events were inevitable, indeed, were dynamically linked because Fed rate hikes would slow speculation, attenuating rising property values, and increasing risk spreads.

In sum, by 2000, the nature of the real estate finance market had changed in a fundamental manner so that it would evolve toward fragility. In the "old days" of the three-six-three model described above, banks and thrifts financed their positions in

mortgages through their retail deposit liabilities. In principle, this exposed them to a maturity mismatch as deposits were short term while mortgages were long term. However, in practice, deposit withdrawals were relatively predictable so long as deposit insurance prevented bank runs, and so long as the Fed kept its interest rate target below legislated ceilings (Regulation Q) on deposit rates. Most withdrawals from one bank or thrift would end up in another bank or thrift, so an institution that faced a clearing drain could turn to the overnight interbank lending market (fed funds) to borrow reserves. Banks also had access to the discount window, while thrifts could turn to the Federal Home Loan Banks for funds. In this way, liquidity needs were met so that the "leverage ratio" of bank and thrift positions in loans was effectively one-to-one.[5] Growth rates of these institutions would be limited because any bank or thrift that tried to grow too fast would face a clearing drain—forcing it to borrow reserves (relatively more costly than cheap retail deposit sources of funds). Further, a credit crunch was caused whenever the Fed pushed the overnight rate target above Reg Q ceilings, causing "disintermediation" as depositors sought higher market returns. For these reasons, a runaway speculative boom in real estate was unlikely because financing was constrained by the institutional structure as well as by Fed countercyclical interest rate policy.

The Fed's experiment with monetarism from 1979-82 created both liquidity problems as well as solvency problems by raising interest rates (higher than 20%) far above Reg Q ceilings and far above earnings on mortgages. As discussed above, the long-term response was to move mortgages off bank and thrift balance sheets. In addition, Reg Q ceilings were eliminated, and new types of deposits such as large denomination negotiable CDs that paid market rates were created.[6] This freed banks and thrifts from local sources of retail deposits as they could always issue an essentially unlimited volume of CDs in national (and international "Eurodollar") wholesale markets. This also allowed

[5] While it is common to measure leverage ratios as the ratio of assets to equity (since losses on assets must come out of equity), the argument here is that in an environment in which home mortgages are safe assets and in which positions in these assets are financed by issuing very stable retail deposits, the relevant measure is the ratio of mortgages to retail deposits. However, as discussed, the liquidity of these positions requires a stable interest rate environment, deposit insurance, and access to funds from the Fed or FHLB.

[6] See Wray 1994 for a discussion of the deregulations in the 1970s and 1980s, including the Monetary Control Act of 1980, which phased out interest rate ceilings, raised deposit insurance limits so that "hot money" jumbo CDs (issued in $100,000 denominations) were covered, overrode usury laws, and allowed thrifts to buy riskier assets.

them to grow at any desired rate—limited only by their ability to locate borrowers and their stomach for risk. This is why many thrifts were able to grow at annual rates of 1000% (and more) in the days leading up to the thrift crisis (Wray 1994). Finally, the expansion of the wholesale market in financial institution liabilities reintroduced the specter of runs on banks—manifested not by long lines of depositors trying to withdraw funds, but by runs on uninsured jumbo CDs. Thus, these developments encouraged behavior that simultaneously led to solvency issues *and* to liquidity problems—neither of which had been faced by regulated banks and thrifts on a large scale in the first three decades after the New Deal reforms.

The growth of securitization led to a tremendous increase of leverage ratios. While the "old model" of home finance involved a leverage ratio of one, the "new model" relies on leverage ratios of 15-to-1 and more, with the owners (for example, hedge funds and pension funds) putting up very little of their own money while issuing potentially volatile commercial paper or other liabilities to fund positions in the securitized mortgages.[7] This worked fine so long as the securities were deemed safe and liquid, which also ensured that the commercial paper and other liabilities issued to finance their purchase were safe and liquid. However, when losses on subprimes began to exceed expectations that had been based on historical experience, prices of securities began to fall. With big leverage ratios, owners faced huge losses, and began to de-leverage by selling, putting more downward pressure on prices. Note that in a world of 15-to-1 leverage ratios, reducing exposure means that many multiples of CDOs relative to own funds must be sold (if equity is $1 billion, to reduce exposure by half requires sales of $7.5 billion if leverage is 15-to-1).The market for securitized mortgages dried up, as did the market for commercial paper.

Modeling by the Bank of England shows that a hypothetical portfolio of subprime mortgage credit default swaps (composed of AAA and AA subprime mortgages originated in 2006) lost 60% of value in July 2007 (Band of England 2007).

[7] As Chancellor (2007) reports, modern risk management techniques use historical volatility as a proxy for risk. As volatility falls, risk is presumed to fall, which induces managers to increase leverage ratios. As discussed in the next section, the period of "the great moderation" suggested that volatility would be permanently lower, hence, higher leverage ratios were deemed prudent. Chancellor reports research that indicates a hedge fund with only $10 million of own funds could leverage that up to $850 million of collateralized mortgage obligations—a leverage ratio of 85 to 1.

> "These losses in RMBS [residential mortgage-backed securities] seemed to trigger a wider loss of confidence in all structured credit products and rating agencies' valuation models. A vicious spiral appeared to begin in which heightened uncertainty about the future value of complex assets and rising risk aversion caused many investors to want to sell but few to buy. Prices fell well outside the range of historical experience and in some cases there appeared to be no market-clearing price for some assets. Investors who had mistakenly made inferences about market and liquidity risk from credit ratings incurred large unexpected losses, contributing to further pressure to sell." (Bank of England 2007).

Problems spread to other markets, including money market mutual funds and commercial paper markets, and banks became reluctant to lend even for short periods. By August, new issues of CDOs had fallen to one-sixth the average monthly volume experienced previously in 2007.

The "old" three-six-three home finance model worked only so long as policy acquiesced, and it failed when policy embarked on a risky Monetarist experiment. The new "originate and distribute" (as it is termed by the Bank of England) model is much less subject to control by policy, and is also less amenable to assistance when things go bad. Most of the players and activities are outside the traditional and direct control of the monetary authorities (including the Fed, the Comptroller, and the FDIC). Instead of a closely regulated industry, home finance has become a mostly unsupervised, highly leveraged, speculative activity—subject to fickle market expectations that are loosely grounded in highly complex valuation models based on relatively short historical runs. As Bank of England simulations show, the expected returns on asset backed securities are "highly sensitive to assumptions about default probability and correlation and rates of loss in the event of default" (Bank of England 2007). When confidence was shaken, prices swung widely, far outside the range of historical experience used in the quant models—and credit dried up. Other than standing by to act as lenders of last resort, there was not much that central bankers around the world could do. However, most of the players do not have direct access to the central bank, but rather rely on complex networks of back-up lines of credit, recourse, and hedges that represent at best contingent and multi-layered leveraging of bank access to central bank funding.

The problems would be sufficiently severe if they amounted to nothing more than a liquidity shortage. In that case, central bank lender of last resort operations could

eventually settle markets, allowing prices to settle and interest rate spreads to narrow. However, as Kregel (2007a) argues, Ninja loans (as well as many of the low doc, no doc, and liar loans) are by definition Minsky's Ponzi schemes, in which payment commitments exceed income.[8] Interest must be capitalized into the loans until some point in the future when income rises or the house's price rises sufficiently that it can be sold to retire the loan. In an environment of slow or no growth of income for most Americans, it is clear that much of the financial structure depended on continued real estate appreciation to validate it—an inherently fragile situation. According to Kregel (2007b), even the senior tranches of many of the subprime mortgage pools have zero net present value because the borrowers will not be able to service the loans after interest rates reset. If the home finance structure is speculative and Ponzi, the problem is solvency, not simply liquidity. Yet, except for a few naysayers, most "experts" discounted the risks, arguing that real estate is not overvalued and debtors are not overburdened—until Countrywide floundered and problems snowballed across the country and around the world.

In the next section we examine some reasons for the complacency.

### 3. The Great Moderation—What, me worry?

*"At particular times a great deal of stupid people have a great deal of stupid money…At intervals…the money of these people—the blind capital, as we call it, of the country—is particularly large and craving; it seeks for someone to devour it, and there is a 'plethora'; it finds someone, and there is 'speculation'; it is devoured, and there is 'panic'.* Walter Bagehot, Lombard Street, quoted in Martin Wolf (2007).

*"New-Deal era has become a term of abuse. Who needs New Deal protections in the Internet age?"* Robert Kuttner (2007).[9]

*"Financial markets, and particularly the big players within them, need fear. Without it, they go crazy"* Martin Wolf (2007).

In the last few years, a revised view of economic possibilities has been developed that goes by the name "the great moderation" (Bernanke 2004; Chancellor 2007). The belief

[8] Others who have used Minsky's analysis of Ponzi positions to characterize the current situation include Buttonwood (2007), McCulley (2007; see also his earlier 2001 warning), Ash (2007), Magnus (2007), and Lahart (2007).

[9] It is important to note that Kuttner's statement is his characterization of prevailing wisdom, not his belief.

is that due to a happy confluence of a number of factors, the world is now more stable. These factors include:

- Better monetary management by the world's major central banks that has dampened inflation and business cycle swings;
- Globalization that makes it easier to absorb shocks because effects are spread;
- Improvements in information technology that allow for better risk assessment and for timely communication;
- Rising profits and declining corporate leverage ratios that allow for higher equity prices;
- Securitization that enhances risk management, and allocates it to those better able to bear the risks; and
- Derivatives that can be used to hedge undesired risk.

Taken together, all of this implies that we live in a new economy that is far less vulnerable to "shocks." Further, central banks have demonstrated both a willingness and a capacity to quickly deal with, and to isolate, threats to the financial system. For example, according to conventional views, Chairman Greenspan was able to organize a successful response to the LTCM crisis, and later rapidly lowered interest rates to steer the economy out of recession that was triggered by the equity market tumble. In the current period, Chairman Bernanke is supposed to have continued in the Greenspan tradition by responding to the subprime crisis by "pumping liquidity"[10] into markets, by quickly lowering the fed funds rate, by taking some of the frown costs out of discount window borrowing—as a few of the major banks were induced to borrow unnecessary funds—and by lowering the penalty on such borrowing as the spread between the fed funds rate and the discount rate was lowered. Even as energy and food prices have pushed inflation up, the Fed made it clear that it remains on guard against any residual fall-out from mortgage losses. Thus, even after hints of problems during the summer of

[10] This term is misleading as it implies that the Fed could simply fly Friedman's helicopters and drop bags of federal reserve notes. Actually, the Fed stood ready to lend reserves at the discount window and to supply them to the fed funds market through bond purchases to keep the fed funds rate on target. If a troubled bank was refused loans in the fed funds market, it could turn to the Fed's discount window to borrow at a penalty rate to meet liquidity needs. To modify a popular old saying, "you can't pump on a string"—the Fed could only supply the reserves desired by the market.

2007, a carefully crafted conventional wisdom was created that a) any real estate mess will be contained, b) that house prices will recover sooner rather than later, and c) that impacts on the "real" economy will be small. Therefore, the stock market could safely continue to party like it is 1929; interest rate spreads could narrow because even the riskiest bets are relatively safe; income, down payments, loan-to-value ratios, and other conventional measures of ability to service debt didn't matter much because real estate asset price appreciation will make all bets good.

**If Minsky were here, he would label this "A Radical Suspension of Disbelief."** As Alex Pollock testified before the US House of Representatives (Pollock 2007), "Booms are usually accompanied by a plausible theory about how we are in a 'new era'…. It is first success, and observing other people's success, which builds up the optimism, which creates the boom, which sets up the bust." The "radical suspension of disbelief" that allowed markets to ignore downside potential created "optimism and an euphoric belief in the ever-rising price of some asset class, in this case, houses and condominiums, providing a sure-fire way to make money for both lenders and borrows. They are inevitably followed by a hangover of defaults, failures, dispossession of unwise or unlucky borrowers, revelations of fraud and scandals, and late cycle regulatory and political reactions."[11] (Pollock 2007)

And, indeed, it is beginning to look like déjà vu all over again. The 1980s thrift crisis was preceded by a tsunami of "innovations" that increased the supply of credit to every manner of swindle, egged-on not only by relaxed rules and supervision, but even by explicit encouragement of regulators, supervisors, and politicians (and by Alan Greenspan who wrote a glowing letter in support of Charles Keating's exploits). Property appraisers willing to certify inflated values played a major role in that fiasco (just as they have in the current real estate boom and bust) (Wray 1994). We are still sorting out the details of that mess two decades later Black (2005). Similarly, the bursting of the equity market bubble at the beginning of this decade followed years of improper insider trading,

[11] Or, as Charles Kindleberger put it, "The propensity to swindle grows parallel with the propensity to speculate during a boom. The implosion of an asset price bubble always leads to the discovery of fraud and swindles." (quoted in Pollock 2007)

"pump and dump" campaigns, and accounting fraud designed to raise stock prices—matters that will continue to tie up the courts for years to come.

Still, it is possible that we ain't seen nothin' yet. Many of the subprime loans are presumably relatively unencumbered by federal rules and regulations because they were made by mortgage brokers chartered and supervised by states. About half of all subprimes were made by such brokers. However, many states outlaw fraudulent practices including predatory lending that burdens borrowers with loans they cannot afford. Indeed, it is suspected that part of the reason for the low doc and no doc loans was to give the brokers plausible deniability: they "didn't know" the borrowers couldn't afford the loans because they never collected the documents that would have been required to make the necessary calculations (JEC 2007)! There are also some hints that the Wall Street firms that sold the asset-backed securities were engaged in "pump and dump" strategies similar to those used by Wall Street during the New Economy boom, selling securities that they simultaneously were shorting as they knew they were "trash".[12]

The players and the markets are intimately and dynamically connected in a way that fuels a growing snowball of problems. As discussed above, insurance on securitized mortgages and other bonds helped to validate high credit ratings assigned by credit raters; other enhancements such as penalties for early repayment, high mortgage rates, and draconian personal bankruptcy rules also helped to fuel the market for subprime-backed securities. However, as the subprime market unravels, fears spread to other asset-backed securities, including commercial real estate loans, and to other bond markets such as that for municipal bonds. Markets are beginning to recognize that there are systemic problems with the credit ratings assigned by the credit ratings agencies. Further, they are realizing that if mortgage-backed securities, other asset-backed securities, and muni bonds are

[12] In a troubling piece, economist and sometime comic Ben Stein castigates Goldman Sachs "whose alums are routinely Treasury secretaries, high advisers to presidents, and occasionally a governor or United States senator," questioning whether Henry M. Paulson, Jr. should be running the Treasury after the questionable practices of the firm over the past few years. Stein argues that while "Goldman Sachs was one of the top 10 sellers of C.M.O.'s for the last two and a half years" it "was also shorting the junk on a titanic scale through index sales—showing…how horrible a product it believed it was selling" (Stein 2007). Further, he even questions the motives of Jan Hatzius, a well-known economist at Goldman Sachs and a housing market bear who warns of impending crisis. According to Stein, this could be part of a strategy used by Goldman Sachs "to help along the goal of success at bearish trades in this sector and in the market generally." While that is almost certainly overstated, betting against performance of the securities you are creating does seem problematic.

riskier than previously believed, then the insurers will have greater than expected losses. Ratings agencies are thus downgrading the credit ratings of the insurers. As the financial position of insurers is called into question, the insurance that guaranteed the assets becomes worthless—meaning that the ratings on bonds and securities must be downgraded. In many cases, investment banks have a piece of this action—they have either promised to take back mortgages, and they have assumed (or will do so) the losses of insurers as the lesser of two evils because the costs assumed due to re-rating of securities after bankruptcy of the insurers are higher than any hit to equity resulting from a take-over of the insurers.[13]

It is far too early to know how all of this will play out, but the past should have been some sort of guide to regulators and supervisors, who could have stepped in earlier rather than standing idly by as they opined that it is impossible to identify a speculative bubble until after it bursts. Edward Gramlich tried to get Alan Greenspan to increase oversight of subprime lending as early as 2000, but could not penetrate the chairman's ideological commitment to "free" markets (Krugman 2007). While it is true that many of the problem loans were originated by institutions outside the usual oversight of the Fed, Kuttner (2007) argues that the 1994 Home Equity and Ownership Protection Act did give the Fed authority to police underwriting standards, and directed the Fed "to clamp down on dangerous and predatory lending practices, including on otherwise unregulated entities such as sub-prime mortgage originators." If the Fed had acted on Gramlich's warnings in 2000, most of the damage could have been avoided—as it wasn't until 2001 that underwriting standards began to fall appreciably. In 2001, sub-primes accounted for 8.6% ($190 billion) of mortgage originations; this rose to 20% ($625 billion) in 2005. And in 2001, securitized sub-primes amounted to just $95 billion, growing to $507 billion by 2005 as the Fed slept at the wheel (JEC 2007, p. 18) .

Even as questions were raised about rising risk, mortgage bankers successfully fought attempts by federal regulators to tighten rules on lending. According to Steven

[13] William Ackman, a hedge fund manager argues that MBIA, the nation's largest bond insurer, could be bankrupt by February. In any case, he questions the triple-A rating of a firm that insures CDOs that have lost billions, forcing the biggest banks to take very large write-downs. Even the CEO of MBIA admits that "our triple-A rating is a fundamental driver of our business model"—meaning that business would dry up if the firm were downgraded. Many analysts are uncomfortable with a business model that *requires* a triple-A rating simply to stay in business (Nocera 2007).

Pearlstein (2007), new federal guidelines were ready in December 2005, but were not implemented until September 2006, as "mortgage bankers fought the proposed rules with all the usual bogus arguments, accusing the agencies of 'regulatory overreach', 'stifling innovation' and substituting the judgment of bureaucrats for the collective wisdom of thousands of experienced lenders and millions of sophisticated investors." This delay allowed subprime lenders to make hundreds of billions of additional loans, many of which duped low income households into debt they cannot service. As late as November 1, 2007, HCL Finance, Inc. was still advertising on its website "Home of the 'No Doc' Loan," with a variety of options including "SISA" (stated income, stated assets), "NISA" (no income, stated assets), "NINA" (no income, no assets), "NEVA" (no income, no job, verify assets), and the famous NINJA (no income, no job, no assets) (https://broker.hclfinance.com/p/program_list.htm).

New York state Attorney General Andrew Cuomo has sued First American Corporation for colluding with mortgage lender Washington Mutual to overstate the value of homes. Internal emails purportedly show that executives at First America's subsidiary eAppraiselT knowingly inflated appraisals to secure business from Washington Mutual (Barr 2007). Real estate appraisers across the country have complained that they were strong-armed by lenders to inflate values; indeed, an industry group (Concerned Real Estate Appraisers from across America) circulated a petition that was presented to Ben Hensen, Executive Director of the Appraisal Subcommittee of the Federal Financial Institutions Council that enumerated unfair practices including:

- the withholding of business if we refuse to inflate values,
- the withholding of business if we refuse to guarantee a predetermined value
- the withholding of business if we refuse to ignore deficiencies in the property,
- refusing to pay for an appraisal that does not give them what they want,
- black listing honest appraisers in order to use "rubber stamp" appraisers, etc.

http://www.appraiserspetition.com

The petition concludes that "We also believe that many individuals have been adversely affected by the purchase of homes which have been over-valued." There is little doubt that inflated appraisals played a major role in fueling the speculative boom—just as they

had helped to create the S&L fiasco in the 1980s by rubber stamping values in "daisy chains" and other fraudulent schemes (Wray 1994).

The ratings agencies were also complicit because their ratings of the securities were essential to generating markets for risky assets.[14] Expressing twenty-twenty hindsight, Fitch now says that "poor underwriting quality and fraud may account for as much as one-quarter of the underperformance of recent vintage subprime RMBS" (Pendley et al. 2007). In a detailed examination of a sample of 45 subprime loans, Fitch found the appearance of fraud or misrepresentation in virtually every one; it also says that "in most cases" the fraud "could have been identified with adequate underwriting, quality control and fraud prevention tools prior to the loan funding." (Pendley et al. 2007). Further, Fitch's investigation concluded that broker-originated loans have "a higher occurance of misrepresentation and fraud than direct or retail origination" (Pendley et al. 2007).

In 2000, Standard & Poor's had decided that "piggyback" mortgages, in which borrowers use a second loan (at a high interest rate) to obtain the money for a down payment are no more risky than standard mortgages[15] (Lucchetti and Ng 2007). Ratings agencies worked closely with the underwriters that were securitizing the mortgages to ensure ratings that would guarantee marketability. Further, they were richly rewarded for helping to market mortgages because fees were about twice as high as they were for rating corporate bonds—the traditional business of ratings firms. Moody's got 44% of its revenue in 2006 from rating "structured finance" (student loans, credit card debt, and mortgages) (Lucchetti and Ng 2007). At first, ratings agencies limited the portion of piggybacks in a subprime mortgage pool to 20%; above that percent, a ratings penalty was imposed. However, buyers seeking higher returns soon began to accept pools with larger portions of riskier loans. In 2006 S&P studied the performance of such loans made in 2002 and found that piggybacks were 43% more likely to default. Still, however, S&P did not lower ratings on existing securities, although it did require underwriters to increase collateral on new mortgages portfolios. During the second half of 2006,

[14] Some consultation between raters and securitizers was, of course, necessary to ensure that the pooled mortgages would find the appropriate market. Problems would arise only if the ratings were not appropriate to the pools.

[15] Incredibly, the riskier piggy-back loan arrangements allowed the borrowers to evade PMI (mortgage insurance) (Chancellor 2007)!

Moody's noticed that an unusually large number of subprime borrowers were not even making their first payments. Finally, in summer 2007, Moody's and S&P began to slash ratings—sometimes by five notches, lowering ratings below investment grade BB (Lucchetti and Ng 2007). Angry investors wondered why it had taken them so long to act.

Re-rating of securities led inevitably to questions about the insurers. According to Frank Veneroso, current ABX index prices (that reflect risks in subprime mortgage-backed securities) suggest "well over a trillion dollars of subprime US mortgages will lose one half their value" (Veneroso 2007a). Moody's and Fitch are reviewing the ratings of the insurers, and the value of their stocks are plummeting—Ambac by 66% since June 1 and MBIA by 40%; ACA Capital Holdings, Inc. fell by 89%; bond insurers reported combined losses of $2.9 billion last quarter (Richard and Gutscher 2007). According to Richard and Gutscher (2007), derivative prices suggest that the probability of default has risen to 28% for MBIA and to 40% for Ambac. If the insurance guarantees are eliminated due to default of the insurers, $2.4 trillion of bonds could fall in value, according to their analysis. Ambac's insured securities backed by home equity lines of credit had already fallen by 15%; if the rest of the insured securities were to experience the same level of write-down, "it would reduce the value of the securities by $150 billion" (Richard and Gutscher 2007). According to the analysis by Richard and Gutscher, these write-downs were minimal—perhaps only a tenth of the writedowns some of the Wall Street banks have been taking for similar mortgage pools. In other words, further write-downs are very likely. Estimates of the cushion that insurers currently have to weather losses is not comforting: MBIA has excess capital of only $550 million against $15.9 billion of CDOs backed by subprime mortgages; Ambac has about $1.15 billion on $29.3 billion of such CDOs and FGIC has $350 million against $10.3 billion of securities.

Henry Kaufman explains that a large part of the problem came from the use of quantitative risk models that relied on the assumption that past performance is a good guide to future performance (Kaufman 200). This requires that the *structure* of the economy and financial system has remained constant even as financial innovation proceeds and a tidal wave of risky assets floods the system. The models could not take account of systemic risk—Goldman Sachs said that according to its computer models, its losses on one of its global equity funds was a "25-standard deviation event," something

that should happen once every 100,000 years (Tett and Gangahar 2007). Satyajit Das, a hedge fund consultant, quipped "People say these are one-in-a-100,000-years events but they seem to happen every year" (Tett and Gangahar 2007). In the case of these new instruments, models are based on data derived from only a few years' experience—and, as discussed above, that was an unusually good period for house prices. Further, since similar models are widely used, the models themselves drive the market—a type of "herding behavior" that was not anticipated and can have devastating results when all are simultaneously "selling out position," as Minsky would put it. James Norman, a managing director in Deutsche Asset Management's quantitative strategies group admitted "Quants are valuation-driven, and when there is a lot of selling, valuations don't matter" (Brewster 2007).

Martin Wolf (2007) nicely summarized the stages of a Minsky model of the transformation of the financial structure:

- Some "displacement" changes people's perception of the future;
- The changed perception leads to rising asset prices in the affected sector;
- Financial innovation provides easy credit to that sector, further fueling asset price appreciation;
- Overtrading in the sector, as markets provide a "fresh supply of 'greater fools'";
- Euphoria develops, more fools join in the fun;
- Warnings of those who cry "bubble" are ridiculed;
- Insider profit-taking by those who know better;
- Revulsion as those who stayed too long panic.

Figure 1a shows the virtuous cycle created over the course of the 1990s that led to the boom and subsequent bust. The "displacement" in this case was the economic stability encouraged financial innovations that "stretched liquidity" in Minsky's terminology; this plus competition urged financial institutions to increase leverage ratios, increasing credit availability. This is because for given expected losses, higher leverage raises return on equity. With easy credit, asset prices could be bid up, and rising prices encouraged yet more innovation and competition to further increase leverage. The virtuous cycle ensured that the financial system would move through the structures that

Minsky labeled hedge, speculative, and finally Ponzi. As discussed, Ponzi finance requires asset price appreciation to validate it—but the virtuous cycle made Ponzi position-taking nearly inevitable.

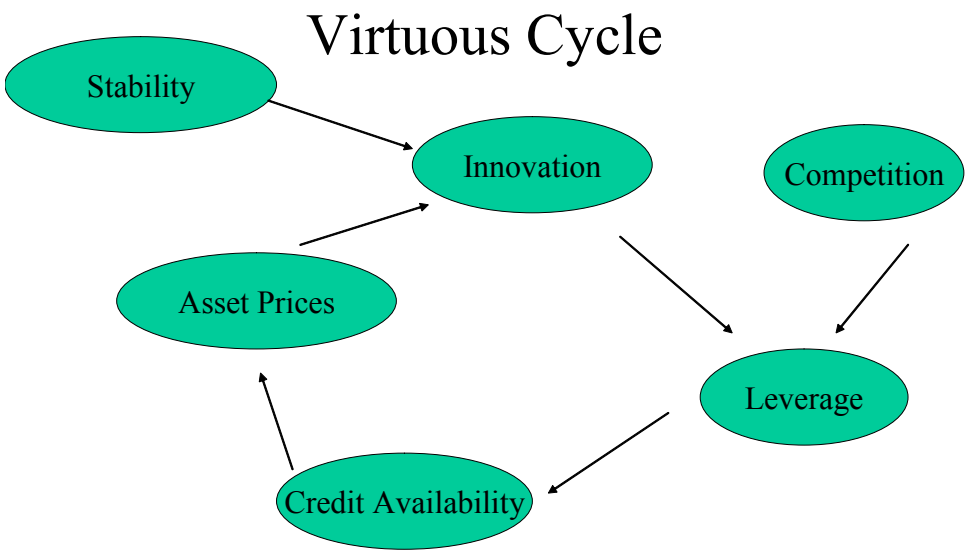



Figure 1a: The Virtuous Cycle

Figure 1b shows the role played by the major participants in fueling the speculative frenzy.

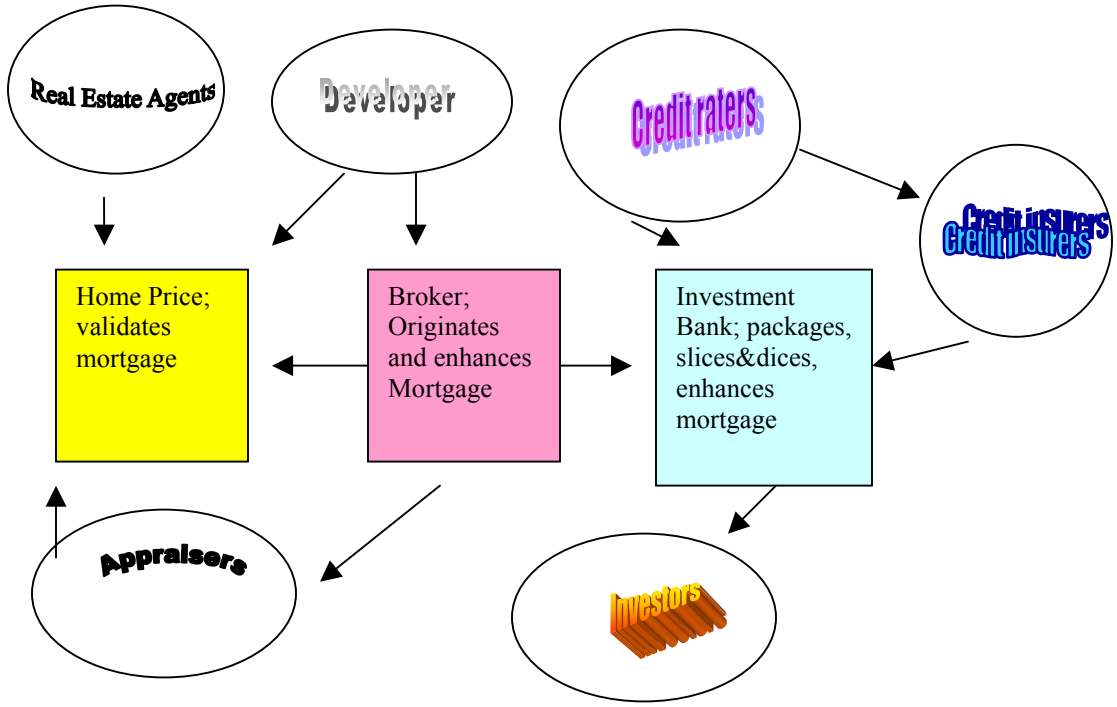



Figure 1b: The Major Players

Developers, real estate agents, and appraisers worked together to maximize home prices. Often the developer worked directly with a mortgage broker so that sufficient funding for inflated prices would be forthcoming; this also required complicity of appraisers to ensure home prices would warrant the mortgage foisted on the borrower. The broker also added the first set of enhancements, such as early payment penalties. Mortgages were then passed along to investment banks that would package them, slice them into tranches, and add further enhancements, such as those provided by credit rating agencies and insurers. "Trash" was thereby transformed into highly rated securities available for purchase by investors such as pension funds. It was the perfect system to fuel rising home prices, ever-increasing debt ratios, and deteriorating portfolios of unsuspecting investors: the incentives of developers, home sellers, and real estate agents were oriented to maximizing home prices; home appraisers and brokers worked together

to facilitate this process, as they were rewarded by throughput—number of deals—but that in turn required that they service the needs of those invested in higher prices. Brokers had no interest in the actual riskiness of the mortgages, however, they did have an incentive to reduce apparent risk by adding enhancements—even if those would subsequently increase defaults by imposing onerous terms that borrowers could not meet. Similarly, investment banks needed the stamp of approval of credit rating agencies to provide a patina of safety; insurers removed any lingering doubts by guaranteeing the securities—with credit raters vouching for the financial strength of the insurers. Finally, the banks provided recourse—they would take the mortgage pools back onto their books at face value—if anything went wrong.

Each of the arrows of Figure 1b provides a link that could be broken, endangering the Ponzi scheme. Unfortunately, every one of these links is now at least weak: homes are not selling, developers are slashing prices to dump inventory, brokers are closing up shop, appraisers have been chastised, investment banks are holding mortgages they cannot sell (and are taking back some securities), investors are trying to sell out positions, ratings agencies are downgrading securities and the insurers, and the insurers are facing huge losses.

In Part II we will explore the possible consequences as well as possible policy responses.

## PART II: THE MINSKY MOMENT: APRES SUBPRIME, LE DELUGE

### 1. Likely Consequences of the Meltdown

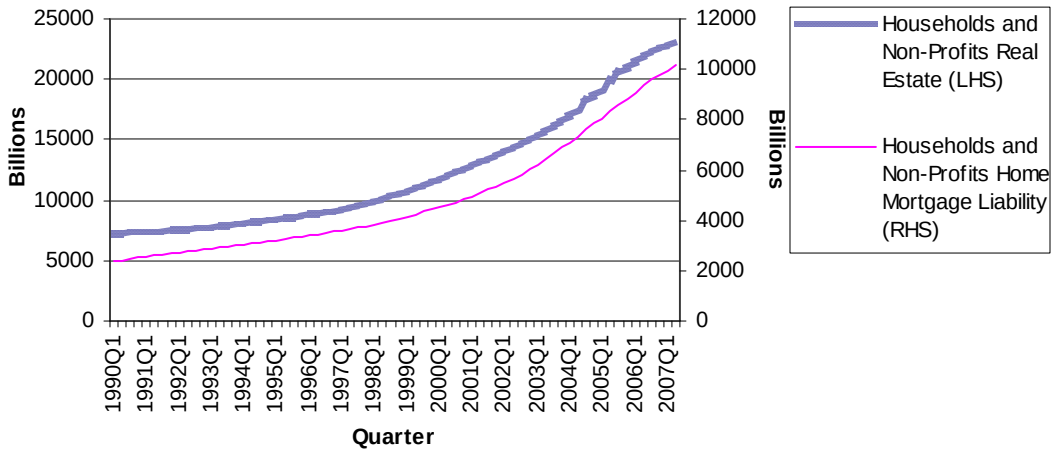
*"The rocket scientists who built models made the same mistakes as Long-Term Capital Management in 1998; they didn't factor in a convergence of correlation when things headed south."* T.J. Marta, quoted by Michael Mackenzie, Gillian Tett, and David Oakley (2007).

*"The subprime mortgage meltdown has economic consequences that will ripple through our communities unless we ac."* Senator Charles Schumer( 2007).

Before we can assess the likely consequences of the real estate meltdown, it is necessary to take stock of the current situation. That also entails an examination of the recent trends to see how we got to the present state.

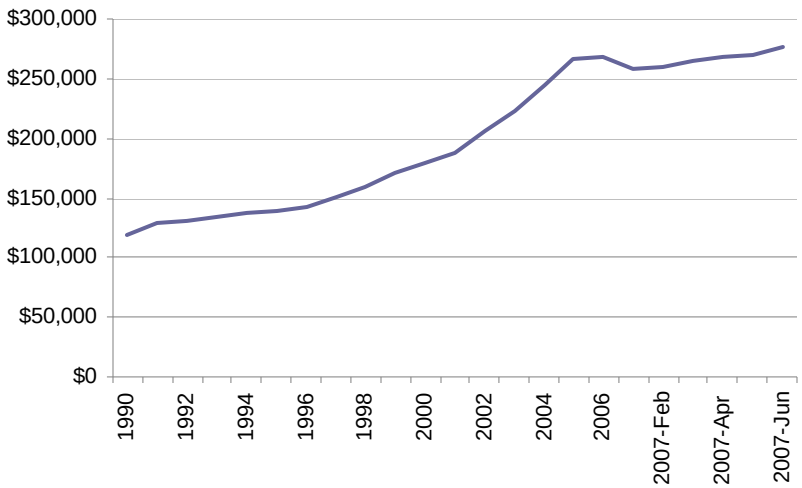
First, it is useful to look at trends for aggregate household real estate value and for aggregate home mortgage liability, as shown in Figure 2. This shows that while real estate values easily doubled over the past decade, from $10 trillion in 1997 to well over $20 trillion by 2005, home mortgage liabilities rose even faster, from less than $2 trillion in 1997 to $10 trillion in 2005. (Indeed, between 2002-06, total credit grew by $8 trillion while GDP only grew by $2.8 trillion.) As is well known, average home prices have also been rising quickly. Figure 3 shows prices rose from around $150,000 in 1997 to a peak above $250,000 in 2005. Robert Shiller's (2007) data (which tries to track sales prices of individual houses) records even more spectacular gains, with the US real housing price index increasing by 85% between 1997 and 2006. Figure 4 shows that new homes for sale have risen sharply since 2002, easily exceeding anything experienced since 1980. While this was initially met by sufficient demand, for the past couple of years, excess supply has developed so that by early 2007, eight months of supply languished on the market.

**Figure 2. Households and Non-Profits Mortgage Liability and Real Estate**



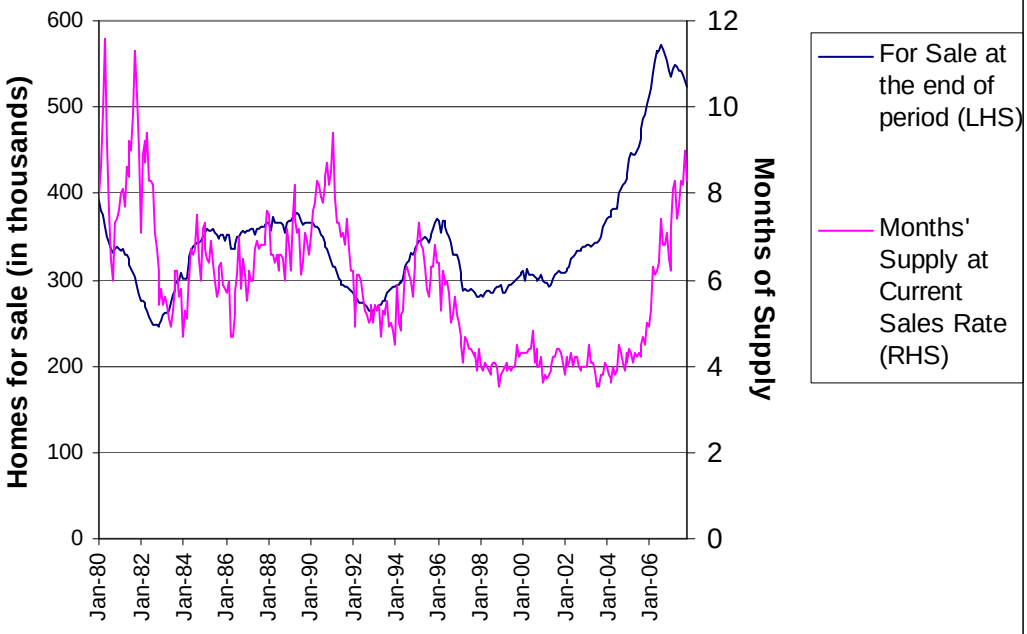

Source: Federal Reserve Board Flow of Funds Accounts

**Figure 3. Average Price For Existing Homes**




Source: National Association of Realtors obtained from HUD USER U.S. Housing Market Conditions

**Figure 4. Home Production Has Outpaced Demand**




Source: Bureau of the Census, U.S. Dept. of Commerce

There are currently more than 2 million vacant homes for sale, an increase of 7% over the past year, and up 57% in the past 3 years (Isidore 2007). Not only are the owners extremely motivated to sell—meaning prices are downward negotiable—but the inventory of unsold homes depresses home values in the neighborhood. Further, vacant homes have other negative impacts on communities, including increased crime and higher costs for local governments (clearing weeds and trash from vacant property). Predictably, house prices are falling—by 4.5% in the third quarter of 2007 compared to a year earlier, the biggest drop since S&P created its nationwide housing index in 1987. The Case-Shiller index of housing prices in 20 major cities declined by 4.9% in September compared with a year earlier, the steepest decline since April 1991 (AP 2007c). This was the ninth month in a row for declining house prices.

Nearly 3 million subprime homeowners face higher interest rates after resets that will occur in the next two years—which will increase the number of foreclosures and vacancies. The Fed has estimated that 500,000 of those will lose their homes after the resets (Reuters 2007c). A recent report by the U.S. Conference of Mayors projects another 1.4 million foreclosures and another 7% drop in real estate values over the next year (Reuters 2007d). The JEC conservatively expects an additional 2 million foreclosures by 2009, which will increase vacancies on the auction block, directly destroying over $100 billion of real estate wealth. Total costs will undoubtedly run higher as unemployment rises, and as neighborhoods suffer from vacancies and declining socio-economic status—foreclosures not only lower the value of neighboring houses but also invite crime that leads to further losses.[16] In California, the foreclosure rate has reached 1 out of every 88 households, with foreclosure filings in the third quarter running four times the number filed a year ago (Reuters 2007d). California property values will fall by 16%, lowering property taxes by $3 billion, hurting local governments. The mayors

[16] Goldman Sachs is now projecting aggregate losses of around $400 billion on outstanding mortgages. This does not sound large relatively to occasional historical losses experienced in equity markets. However, the Goldman Sachs US Economic Research Group warns that is not a relevant analogy. Mortgage securities markets are highly leveraged, with 10 to 1 ratios not at all uncommon. If leveraged players (such as banks, broker-dealers, hedge funds and GSEs) incur losses of $200 billion in these markets, they might need to scale-back balance sheets by $2 trillion (with a leveraged ratio of ten to one). Thus, while $200 billion (or $400 billion) is not large relative to the US economy or to US financial markets, $2 trillion (or $4 trillion) is. (U.S. Daily Financial Market Comment 2007). Veneroso (2007a) notes that estimates of total direct losses continue to rise—currently toward $500 billion, and it is likely that they will soon approach a more likely figure of $1 trillion.

predict that related problems such as neighborhood blight as well as crime will rise—at a time that state and local governments will be hard-pressed to afford to do anything about it.[17]

Table 1 below provides mortgage origination statistics. Annual originations grew from $2.2 trillion in 2001 to nearly $4 trillion in 2003 before settling around a figure of about $3 trillion in the years 2004-06. Of that, subprime originations grew from just $190 billion in 2001 to $625 billion in 2005; as a percent of the dollar value of total originations, subprimes grew from 8.6% to 20% of the market. Over the same period, the percent of subprimes securitized increased from half to 80%. According to data reported by the JEC, the vast majority of such securitizations (83.4% in 2004) were undertaken by independent mortgage bankers (and only 2.6% by CRA-regulated lenders). So-called liar loans increased from a quarter of subprimes in 2001 to 40% in 2006. (Morgenson 2007a). Average *daily* trading in mortgage securities rose from $60 billion in 2000 to $250 billion by 2006. (Morgenson 2007a).

**Table 1. Mortgage Origination Statistics**

| | Total Mortgage Originations (Billions) | Subprime Originations (Billions) | Subprime Share in Total Originations (percent of dollar value) | Subprime Mortgage Backed Securities (Billions) | Percent Subprimes Securitized (percent of dollar value) |
|---|---|---|---|---|---|
| 2001 | $2,215 | $190 | 8.6 | $95 | 50.4 |
| 2002 | $2,885 | $231 | 8.0 | $121 | 52.7 |
| 2003 | $3,945 | $335 | 8.5 | $202 | 60.5 |
| 2004 | $2,920 | $540 | 18.5 | $401 | 74.3 |
| 2005 | $3,120 | $625 | 20.0 | $507 | 81.2 |
| 2006 | $2,980 | $600 | 20.1 | $483 | 80.5 |

Source: Inside Mortgage Finance, The 2007 Mortgage Market Statistical Annual, Top Subprime Mortgage Market Players and Key Data (2006)

Table 2 shows the evolution of underwriting standards for subprime loans. The percent of such loans with adjustable rates rose from about 74% in 2001 to more than

[17] Jerry Abramson, Mayor of Louisville Kentucky put it this way: "What the mayors are most concerned about is what happens to those homes when the foreclosure begins and ultimately ends….As the decrease in value occurs around homes that are being foreclosed on and left vacant or boarded, all of the sudden the property tax decreases. We've got to put more money into going in and policing the area. We've got to put more money into going in and keeping them boarded up and as safe as can be possible" (Marketplace 2007).

93% in 2005; interest-only loans rose from zero to nearly 38% over the same period; and the low or no doc share rose from 29% to more than half. Data provided by the JEC shows that over the same period, hybrid adjustable rate mortgages (those with teaser rates for 2 or 3 years, after which loans would be reset at higher rates) rose from just under 60% of securitized subprimes in 2001 to nearly three-quarters by 2004 (JEC 2007, Figure 12). In other words, the riskiest types of subprimes—ARMS and hybrid ARMS—were favorites with securitizers. From 2004-2006 (when lending standards were loosest) 8.4 million adjustable rate mortgages were originated, worth $2.3 trillion; of those, 3.2 million (worth $1.05 trillion) had "teaser rates" that were below market and would reset in 2-3 years at higher rates.[18] (Bianco 2007) The JEC also provides data that shows that riskier subprimes are much more likely to face prepayment penalties—apparently imposed to enhance credit ratings on the securitized mortgages. For example, the percent of prime ARMs originated in 2005 with prepayment penalties was just 15.4%; by contrast 72.4% of subprime ARMs carried a penalty. The typical penalty is six month's interest on 80% of the original mortgage balance, which could total $7500 for a $150,000 mortgage [19] (JEC 2007). In addition, the subprime ARM carried a 326 basis point premium over a prime ARM loan (JEC 2007, Figure 15).

**Table 2. Underwriting Standards in Subprime Home-Purchase Loans**

| | ARM Share | IO Share | Low-No-Doc Share | Debt Payments-to-Income Ratio | Average Loan-to-Value Ratio |
|---|---|---|---|---|---|
| 2001 | 73.8% | 0.0% | 28.5% | 39.7% | 84.04% |
| 2002 | 80.0% | 2.3% | 38.6% | 40.1% | 84.42% |
| 2003 | 80.1% | 8.6% | 42.8% | 40.5% | 86.09% |
| 2004 | 89.4% | 27.2% | 45.2% | 41.2% | 84.86% |
| 2005 | 93.3% | 37.8% | 50.7% | 41.8% | 83.24% |
| 2006 | 91.3% | 22.8% | 50.8% | 42.4% | 83.35% |

Source: Freddie Mac, obtained from the International Monetary Fund
http://www.imf.org/external/pubs/ft/fmu/eng/2007/charts.pdf

[18] Of the $1 trillion dollars of teaser rate mortgages, $431 billion had initial interest rates at or below 2% (Bianco 2007).

[19] An example will help. A subprime hybrid adjustable rate mortgage on a $400,000 house might have initial payments of about $2200 per month for interest-only at a rate of 6.5%. After a reset, the payments rise to $4000 per month at an interest rate of 12% plus principle. (AP 2007a).

As underwriting standards fell, delinquency rates rose, as shown in Figure 5. Not surprisingly, delinquency rates for adjustable subprime loans rose fastest and farthest as troubles hit the real estate market over the course of 2006. Already, delinquency rates for such loans are reaching toward 20%. Figure 6 shows a similar increase for foreclosure rates, which reached nearly 8% for subprime adjustable rate loans in the beginning of 2007. Data presented by the JEC (2007, Figure 14) shows that subprime loans of the most recent vintage (i.e. those made in 2007 and 2006) have much higher delinquency rates; further, delinquency rates seem to peak between 18 and 20 months after origination, meaning that the worst is probably still to come. During the third quarter of 2007, foreclosures reached nearly half a million, up 34% from the second quarter, and twice as high as the number for third quarter of 2006 (AP 2007a). According to the Center for Responsible Lending, two-thirds of the foreclosures filed for the year ending June 30, 2007 involved subprime loans; Banc of America Securities reported that 93% of foreclosures completed during 2007 (through September) involved adjustable-rate loans that were made and securitized in 2006 (Morgenson 2007b).

Figure 5. Comparisons of Prime vs Subprime Delinquency Rates, Total U.S. 1998-2007

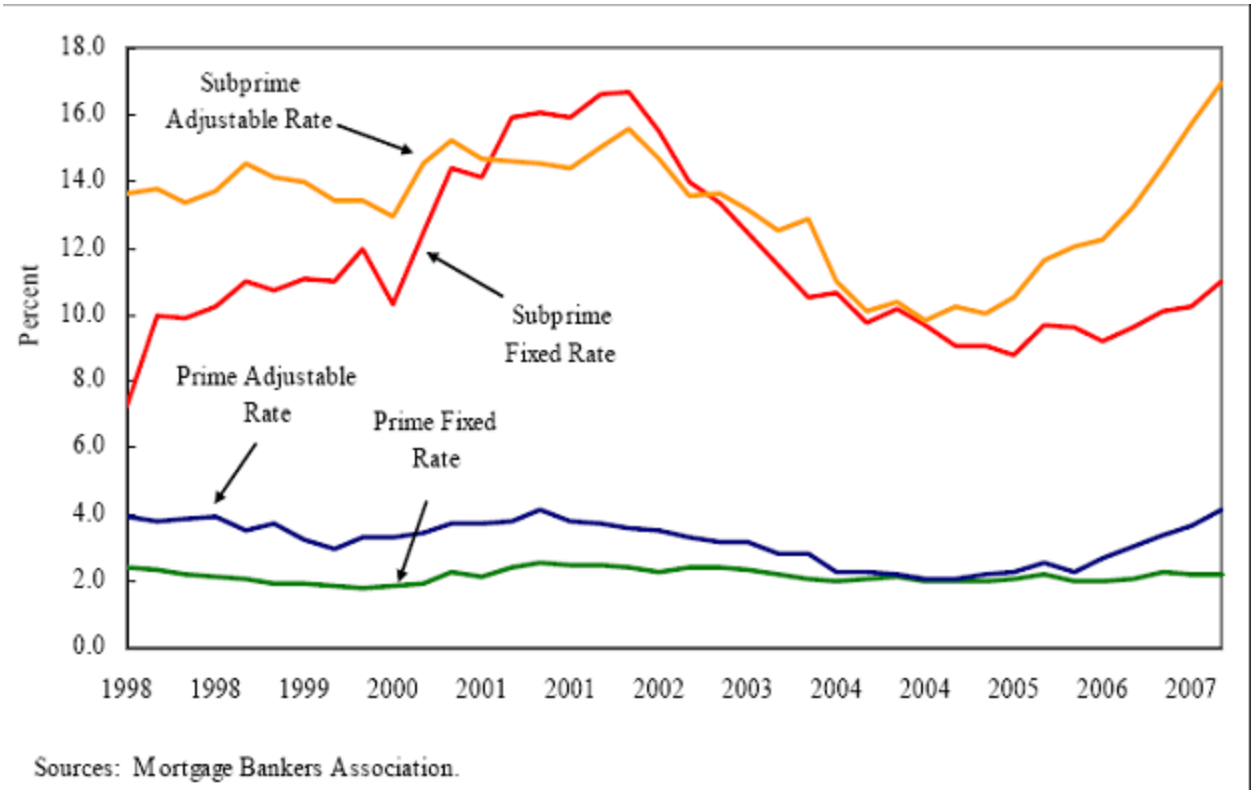
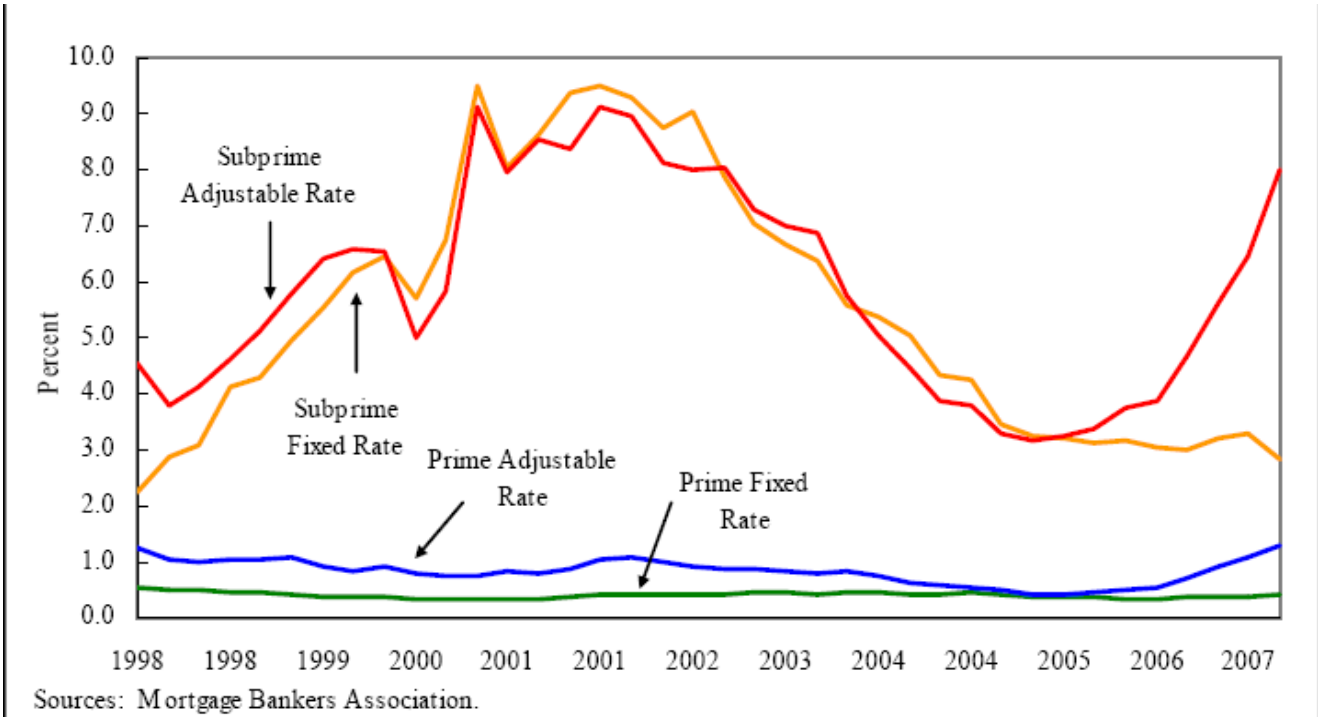


Figure 6. Comparisons of Prime vs Subprime Foreclosure Rates, Total U.S. 1998-2007




No one really knows who is bearing all the risks. Recall that securitization of mortgages was supposed to shift interest rate risk off the balance sheets of banks and thrifts. However, as mentioned above, among the institutions first impacted were foreign banks in Germany, the UK, and France. It is becoming increasingly apparent that American banks will be seriously affected because they promised to bear losses (through recourse) if the mortgages they securitized for originators sold below face value. According to Floyd Norris (2007c), American Home Mortgage Holdings is suing Bank of America for reneging on swap deals it had made. While the details are complex, American Home made subprime loans and sold them to its own special purpose entities, which financed their purchases by issuing commercial paper. To enhance the demand for the paper, American Home obtained swap agreements from Bank of America and others that would cover losses if the entities had to sell mortgages for less than face value. Performing loans are now selling for 80% of face value, with nonperforming loans selling for as little as 54% of face value. Thus, banks took on risks and now face losses for loans they did not even originate, much less held! The problem is not restricted to subprime

loans; even prime loans are experiencing sharply spiking foreclosure rates—something that is highly unusual in a period in which unemployment rates have not risen significantly. Further, as Whalen (2007) reports, securitized mortgages were also purchased by banks seeking the expected higher returns they would generate—often through specially created subsidiaries, that are now being bailed out by their bank owners that must assume the securities. Ironically, the financial instrument that was supposed to reduce bank risks has led to a situation in which banks now hold packages of mortgages originated by those who had no interest in evaluating the likelihood that debtors could service their debt.

In other words, banks abandoned relationship banking that allowed them to assess risk of borrowers as they turned to securitization and fee income, but now they hold the debt of borrowers whose risk was never evaluated by anyone. As an example, on November 5, Citigroup admitted that it had created a "liquidity-put," inserting a put option into CDOs backed by subprime mortgages. "The put allowed any buyer of these CDOs who ran into financing problems to sell them back—at original value—to Citi" (Loomis 2007). When the market for the CDOs began to dry up, holders of the liquidity-put returned $25 billion subprime securities to Citi, increasing Citi's total holdings of subprime related securities to $55 billion. This seems to have been the last straw for Chairman Charles Prince, who was forced to resign—replaced by Robert Rubin—as Citi announced write-downs of $8 to $11 billion. The whole idea of securitization was to get mortgages off the balance sheets of banks, but the "recourse" offered by these puts ensured that if things go badly, the mortgages would be right back on the balance sheets at the worst possible time.

Of course, homeowners are not the only ones suffering. As Bajaj (2007) reports, "Collateralized debt obligations—made up of bonds backed by thousands of subprime home loans—are starting to shut off cash payments to investors in lower-rated bonds as credit-rating agencies downgrade the securities they own…[this] is expected to accelerate in the months ahead." Moody's and Standard & Poor's are lowering the ratings on huge blocks of such bonds; as ratings decline, the trustees of the debt obligations are forced to discount the value of their portfolio. However, it takes "months for ratings downgrades to work their way through the system" (Bajaj 2007). As John Schiavetta, managing director

at Derivative Fitch (responsible for rating the debt) says, "It's still the early stages of a very significant stress" (quoted in Bajaj 2007 ). This is forcing investment banks to write-down their assets: recent write-downs include those by Merrill Lynch ($8.4 billion), UBS ($3.4 billion), Citigroup ($1.3 billion) (Bajaj 2007; Hutchinson 2007). Bank of America's earnings on its fixed-income activities fell by 93% in the third quarter of 2007; Citigroup's profits in all activities fell by 57% (Dash 2007).

Note that losses are not limited to the mortgage markets—Bank of America also lost $2 billion on credit cards due to rising personal bankruptcies, and is setting aside reserves for expected losses on its construction loans as the construction industry deteriorates. Citigroup now expects losses of $8 to $11 billion on its portfolio of $43 billion collateralized debt obligations (Norris 2007a). Goldman Sachs thinks the losses will be even larger, warning that write-downs at Citigroup will be $15 billion. (Shell 2007). The top 10 global banks have already taken write-offs of $75 billion during 2007 (AP 2007a). JP Morgan has warned that large bank CDO losses could reach $77 billion, while aggregate losses would be $260 billion on such assets. According to the analysis, the losses on the "super-senior" or *safest* CDOs will be between 20% and 80%! A JP Morgan analyst wryly wrote that "One of the benefits of the securitization is the offloading and global distribution of risk. Ironically, this is now a capital markets hazard, since no one is sure where subprime losses lurk" (Bloomberg 2007). Banks ended up holding so many of the CDOs because they could not sell them; other holdings came from promissory agreements and from seizures of collateral from hedge funds (Shen 2007). Lest one question the source, the JPMorgan team of CDO research was deemed to be the best, according to a poll by *Institutional Investor* (Bloomberg 2007). They believe that bond insurers face losses of $29 billion on CDOs they hold.

Problems are spilling over into the commercial paper market, where there is about $2.2 trillion outstanding, of which $1.2 trillion is backed by residential mortgages, credit card receivables, car loans, and other bonds (Morgenson and Anderson 2007). As ratings agencies have been downgrading issuers of commercial paper due to declining quality of the underlying assets, some money market funds have been forced to ban redemptions. As of mid November 2007, the dollar volume of asset-backed commercial paper has shrunk by about 30% since its peak in August. Because issuers cannot sell new paper,

they have been forced to tap bank credit lines (Mackenzie et al. 2007). Problems have spread outside the U.S., with the European asset backed commercial paper market shrinking from a peak of $300 billion to about $170 billion in November.

The crisis is spreading to the commercial real estate market—securitized mortgages backed by commercial real estate are now carrying an interest rate spread of over 1500 basis points for BB tranches and new issues are down by 84% (Veneroso 2007a). The value of such securities was about $800 billion at the end of the first quarter of 2007, and some are projecting losses of at least $100 billion. Fitch has issued a warning about "overly optimistic expectations of future rental rates, sales growth and market growth" in the commercial property sector (Chittum and Forsyth 2007). RBS Greenwich Capital is predicting that US commercial property prices will fall 10-15% next year (Veneroso 2007a). Some analysts are predicting that there will soon be a run out of asset-backed commercial paper because no investors want to be caught holding such paper over year-end (Private communication, fixed income strategist). With perhaps half a trillion dollars worth of potentially worthless paper on the balance sheets of the biggest global banks, the fallout "could dwarf the nation's last big banking crisis—the failure of more than 1,000 savings and loans in the 1980s"—that required a $125 billion government bailout (AP 2007a).

Other markets are also affected. There are now rumors about the muni bond market—and as insurers are downgraded, the market for new issues will dry up. This calls to mind Minsky's well-known analysis of the 1966 credit crunch set off by problems in the muni bond market. Recent reports indicate that problems are also spreading to money-market funds that had been considered to be a safe haven. Indeed, money-market funds have been growing—to about $3 trillion on November 6, 2007, partly in reaction to liquidity and solvency problems in other asset markets. However, the ten largest managers of money funds had invested $50 billion in short term structured investment vehicles that are now losing money. As a result, Legg Mason had to invest $100 million in one of its funds, and arranged for $238 million in credit for two others (Harrington and Condon 2007). Bank of America might provide up to $600 million to prop up its funds (Harrington and Condon 2007). The Treasury is trying to arrange for an $80 billion fund to back-up SIVs, which typically borrowed by issuing short-term commercial paper in

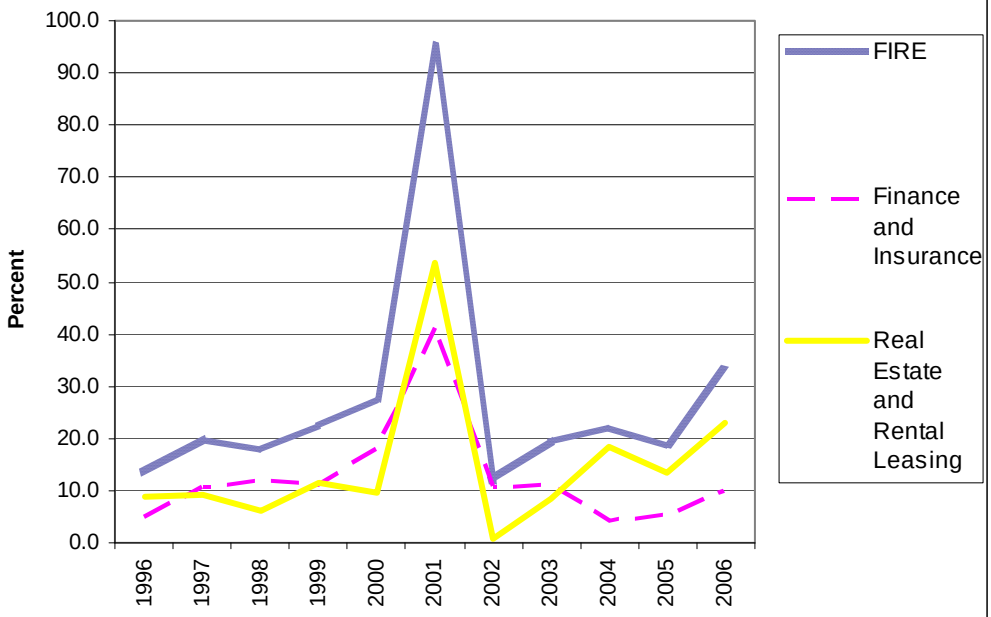
order to buy longer-dated assets such as bank bonds and mortgage-backed securities. So far, "fire sales" have reduced the average net asset value of SIVs by more than 30% (Harrington and Condon 2007).

Perhaps signaling further problems in both money market funds and in local government finance, the state of Florida had to suspend withdrawals from a state-operated investment pool as a run had eliminated 40% of its assets in two weeks (Associated Press 2007e). The pool operated much like a private money market fund, enabling cities, counties, and school districts to obtain higher returns on short-term investments, withdrawing funds as needed to pay wages and other operating costs. Problems began when $700 million in asset-backed commercial paper was downgraded that triggered a run. This is not likely to be the last run on an investment pool.

The FIRE (finance, insurance, and real estate) sector is shedding jobs as a result of the housing downturn. Through October 19, New York based financial services companies had cut 42,404 jobs in 2007 (Bajaj 2007). The Labor Department estimates that 100,000 financial services jobs have been lost nationwide (AP 2007a). Figure 7 shows the contributions to real GDP growth by components of the FIRE sector. During the recession at the beginning of this decade, the FIRE sector accounted for nearly all of the growth of real GDP; during the real estate boom from 2002, it accounted for 10% to 30% of annual GDP growth. The real estate sector alone (including rental leasing), accounted for half of real GDP growth during the recession, and then for about 20% of real GDP growth in the mid 2000s. As the sector slows, the impact on overall growth will be significant. Plummeting real estate values causes losses for suppliers to the home renovation market. Home Depot has reported a 26.8% drop in third quarter profits for 2007 (AP 2007b). Some analysts are projecting that GDP growth will fall to zero, and based on historical data that would mean 3 million job losses—fifty percent more than the number of jobs lost during the past recession that followed the New Economy bust[20] (AP 2007a).

[20] While wages and jobs growth figures were not that bad during the fall, Norris (Nov 30, 2007) reports that the estimates are being revised. Official figures based on payrolls data were probably far too rosy—with average monthly jobs growth at 125,000. Household surveys, however, showed job losses. Recent revisions lowered growth of wage and salary income for the second quarter from 4.5% to just 1.6%; according to Norris, the jobs numbers will be similarly revised downward.

**Figure 7. Contribution of FIRE Sector to Percent Change in Real Gross Domestic Product**




Source: Bureau of Economic Analysis Industry Economic Accounts

The crisis continues to spread internationally. Indeed, the first bank to fall was IKB in Germany—which apparently had a credit guarantee to a conduit equal to 40% of its assets—bailed out by a group of government-backed banks. In August, BNP Paribas in France had to stop investors from taking money out of three funds that had invested in American mortgage securities (Bajaj and Landler 2007). UBS lost 4.2 billion Swiss francs in the third quarter of 2007 due to its subprime holdings, and warned that it will have to write down more in the fourth quarter. UBS reported it is still holding $20.2 billion of "highly illiquid 'super senior' debt," as well as nearly $20 billion of residential mortgage-backed securities and collateralized debt obligations (Reuters 2007b). European banks have already taken charges of more than $40 billion on holdings in mortgage-backed securities (Werdigier 2007). Barclays is writing down $2.7 billion worth of assets due to losses on securities linked to the U.S. subprime crisis (Reuters 2007a). However, it still has 5 billion pound exposure to collateralized debt obligations as well as 7.3 billion pounds of unsold leveraged finance underwriting positions (Reuters 2007a). While securitization in Europe has not proceeded on a scale that approaches what

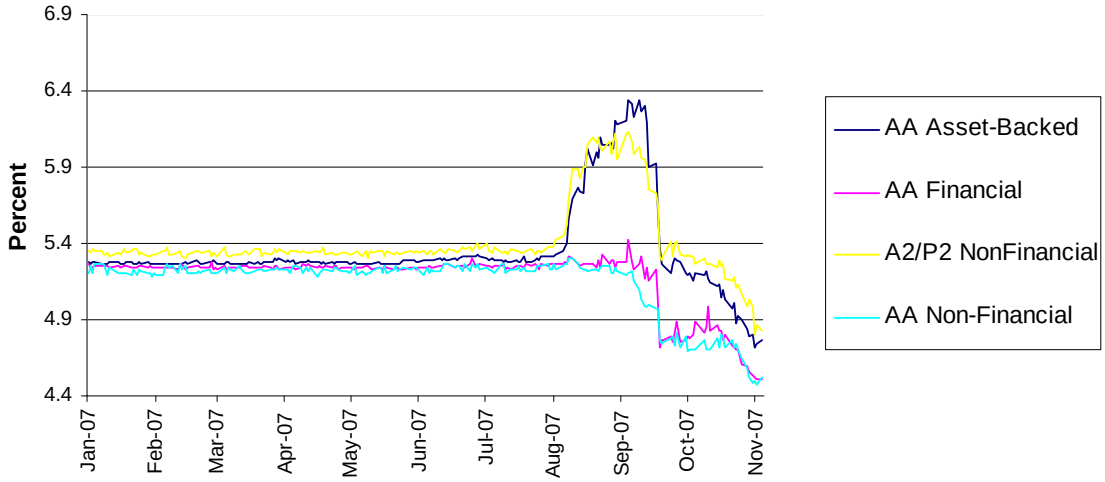
has occurred in the U.S., many are worried that the legal framework does not "provide authorities with the necessary tools for supervising cross-border banking groups," and that they are ill-prepared to deal with a region-wide financial crisis[21] (Veron 2007). On November 22, 2007 two French banks paid $1.5 billion to take over CIFG Holdings (a large bond insurance company operating in Europe) on fears that it would lose its AAA credit rating due to losses on mortgage loans (Landler and Werdigier 2007). CFIG had been created in 2001 by Natixis bank in order to move into exotic asset-backed securities; CFIG says it has direct exposure to $1.9 billion of residential mortgages. Dexia is expected to post an $871 million write-down for the third quarter of 2007, most due to losses at CFIG. Swiss Re, a giant reinsurance company in Zurich also had to take big write-downs due to losses in mortgage-related securities (Werdigier 2007b).

As Richard Bookstaber says, conventional wisdom was that globalization of finance should have increased stability by distributing risks and allowing for diversification of asset holdings. However, in practice, "everybody tends to invest in the same assets and employ the same strategies" (Schwartz 2007). And, of course, they simultaneously sell out of the same assets. In late November the crisis spread to Asia, with panic withdrawals from money market funds and credit derivatives in search of safe government debt and insured deposit accounts. (Evans-Pritchard 2007) Even the Bank of China reported big losses from the $9.7 billion of subprime mortgage-backed securities it holds (Bloomberg News 2007). Japan's Mitsubishi UFJ Financial Group holds about $2.6 billion of such securities. Problems in Asia quickly circled the globe, returning to Europe, where spreads on low-grade bonds were climbing 10 basis points a day, causing the European Covered Bond Council to suspend trading in mortgage-backed securities (Bloomberg News 2007). The "Ted spread" (the spread between commercial Libor rates and US Treasury bills) rose to nearly 150 basis points, the highest since the 1987 stock market crash. HSBC Holdings announced on November 26 that it would bail out two of its structured investment vehicles (SIVs), returning $45 billion of assets to the bank's balance sheet. It had already written off $3.4 billion of bad consumer debt, and is expected to set aside another $12 billion.

[21] One problem that we will not take up here is the absence of a Euroland treasury with the fiscal capacity equal to that of the U.S. Treasury. The individual Euro nations are constrained in their ability to bail-out a financial crisis and to protect depositors from losses, and the European Parliament's budget is too small.

It is difficult to project the possible impacts of the subprime meltdown on the continuing availability of credit. The initial impact led to a severe credit crunch, as Figure 8 below shows. Commercial paper interest rates immediately spiked, although stress was relieved by prompt lender of last resort intervention of the Fed, which supplied reserves on demand. Two of the biggest sources of credit to firms, commercial paper and commercial and industrial bank loans, retrenched by 9% between August and mid-November, the biggest drop on record since the Fed began tracking the volume of such credit in 1973 (Goodman 2007). There have been previous periods with downturns in these forms of credit—although none of them were this large—generally associated with recessions and economic slowdowns.

**Figure 8. Commercial Paper Rates (30 Day)**




Source: Federal Reserve Board Statistical Releases

A rolling credit crunch hits market after market, and region after region. When it looks like liquidity problems are being attenuated in one market, the infection quickly spreads to another. S&P has downgraded 381 tranches of residential mortgage-related CDOs so far this year, and has another 709 on a watch list; Moody's downgraded 338 tranches and has kept 734 on its watch list for further downgrades (Wood 2007). New issues of mortgage backed securities have fallen to barely $20 billion; the spreads on BB tranches of the CMBX index have risen to 1500 basis points in November (Wood 2007). Even Larry Summers is now warning "there is the risk that the adverse impacts will be

felt for the rest of this decade and beyond" and that "streams of data indicate how much more serious the situation is than was clear a few months ago" as "the housing sector may be in a free-fall" (Summers 2007). He goes on to note that the two-year Treasury bond rates dropped below 3%, that single family home construction could be down by 50% from peak, that house prices could fall by 25%, and that banks "will inevitably curtail new lending as they are hit by a perfect storm of declining capital due to mark-to-market losses, involuntary balance sheet expansion as various backstop facilities are called, and greatly reduced confidence in the creditworthiness of traditional borrowers as the economy turns downwards and asset prices fall" (Summers 2007).

The next shoe to drop could be a downgrading of investment banks due to problems in "level 3" assets. From November 15, banks have to divide their assets into three levels, depending on ease with which values can be determined from market prices. Level 1 assets have values determined by quoted prices in active markets. By contrast, level 3 assets do not have readily available markets, so their values are determined by the bank's own model (Hutchinson 2007). Banks have an interest in avoiding classification of too many assets as level 3; however, early reports by banks as of the end of August or September show that they total up 7.4% of total assets (Morgan Stanley), and are above 5% of total assets for Goldman Sachs, Lehman Brothers, Bear Stearns, and Citigroup. More problematic is the ratio of level 3 assets to shareholders' equity: Morgan Stanley has $88 billion in level 3 assets against equity of just $35 billion (ratio = 2.5); others with ratios above 1.0 include Goldman Sachs (1.8), Lehman (1.6), Bear Stearns (1.6), and Citigroup (1.1) (Wood 2007).

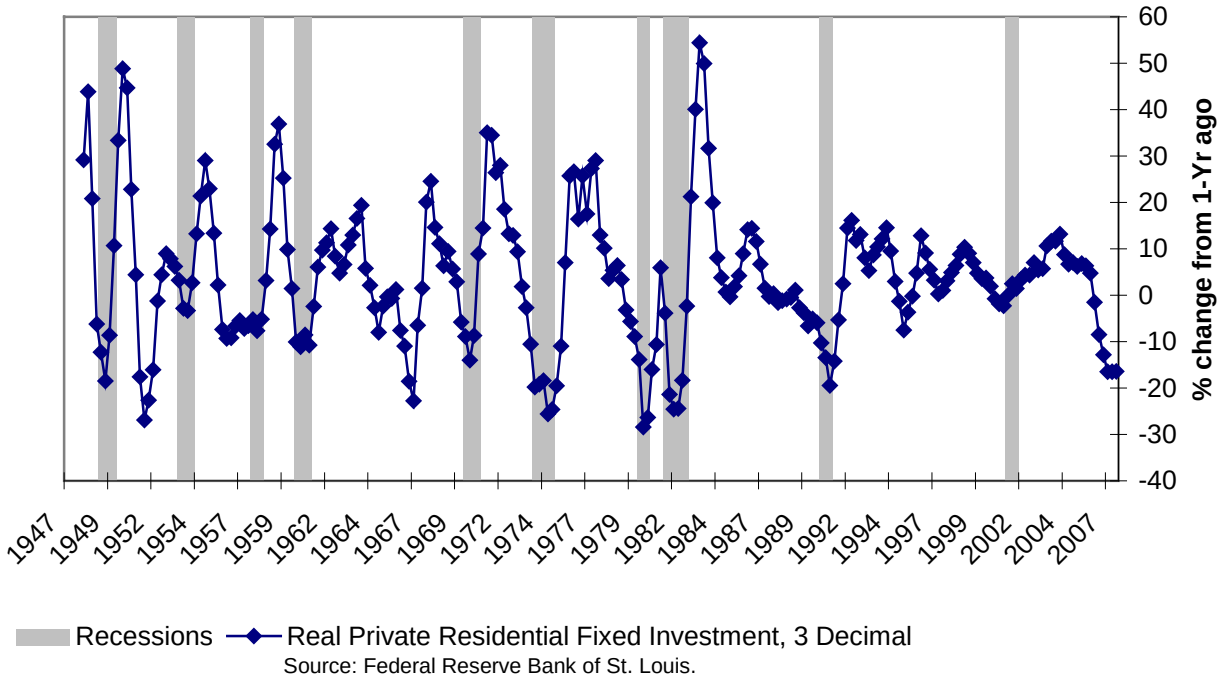
The Fed reacted to the meltdown by lowering interest rates—first by 50 bp and then again by 25 bp on October 31, in spite of reasonably good GDP and employment data, and reasonably bad inflation data. It is clear that the Fed's rate reductions have more to do with financial and real estate markets than with "fundamentals." GDP growth was at 3.8 percent (as of September 30), consumer spending grew at 3%, and unemployment remained at a relatively low 4.7%. However, home sales, housing prices, and consumption all came in worse than expected (Andrews 2007). The Fed felt trapped at its October meeting because if it had not lowered rates, there would have been a huge sell-off in equity markets; unfortunately, the celebration over the rate cut was short-lived: rate

cuts at this point can merely confirm the market's suspicion that things are going badly. As of late November, markets are projecting about a 90% probability of further rate cuts in December, although Fed officials are proclaiming that is unlikely unless data worsen considerably before the next meeting.

It seems that the only sure thing is to bet against subprimes. Tellingly, a California hedge fund that shorted subprime mortgages earned a return greater than 1000% after fees during 2007. Andrew Lahde's Lahde Capital of Santa Monica might have made the greatest return of all time betting against residential mortgages; he is now putting his profits into bets against commercial real estate. John Paulson's New York-based Paulson&Co and a few others also earned returns well above 500% by shorting U.S. home loans.

There is a fairly large body of evidence that housing downturns precede recessions. Indeed, Edward Leamer (2007) has provocatively argued that what appears to be a business cycle is actually a housing cycle. Using a large number of measures, he claims to demonstrate that the so-called business cycle is actually a consumer-led cycle, and that the component of consumer spending that best "explains" the cycle (econometrically speaking) is housing. While I think this is probably overstated, there does appear to be a correlation, as shown in Figure 9 below, although causation could usually go the other way. Norris (2007b) notes that while the Fed was still forecasting at the end of November that the economy faces a slowdown but no recession, this would be "the first time ever that a housing slowdown this severe has not coincided with a recession. In fact, there has never been a [housing] slowdown of anything like this magnitude until after a recession was under way." He goes on to show that new-home starts are down by 47% compared with a similar period two years ago. Since the early 1960s there have only been three previous cycles when starts fell by at least a third: in 1974, 1980, and 1991—all of which occurred during recessions.

**Figure 9. Correlation of Housing Sector Declines and Recessions: Real Private Residential Fixed Investment, 3 Decimal**




Source: Federal Reserve Bank of St. Louis.

Finally, it must be remembered that the household sector was already in a precarious situation even before the meltdown, as documented in numerous studies published by colleagues at The Levy Economics Institute. Since 1996, households have persistently spent more than their incomes, running up huge debt. During the internet boom, this could be justified because of all the financial wealth created by equity price appreciation; effectively, the private sector was borrowing against its capital gains. Of course, the stock market crash wiped out over $7 trillion of financial wealth—while almost all of the debt remained. More recently, the borrowing was even more directly related to rising housing wealth—as home equity cash-outs total $1.2 trillion since 2002 (equal to 46% of the growth of consumption over the period) (Wood 2007). As this source of finance dries up, the hit to consumption could be large. Further, as demonstrated by several Levy Institute Strategic Analyses, economic growth fueled by household consumption requires that indebtedness grows faster than income. Financial markets are demonstrably fickle—billions of dollars can be lost in a day. Ultimately, it is risky to back household debt with the expectation of continued appreciation of real estate

values and stock prices. Perhaps the whole financial structure might be brought down in a wave of defaults, plummeting asset values, and bankruptcies. However, that is not required to turn a slow-down into a deep recession. All that must happen is that consumers finally retrench, and return to a normal pattern of "living within their means." All else equal, if the private sector were to reduce spending to, say, only 97 cents per dollar of income, this would lower GDP by half a dozen percentage points. And if the private sector were really spooked, it might reduce spending to 90 cents on the dollar—as it usually does in recession—taking a trillion and a half dollars out of GDP, leaving a huge demand gap that is unlikely to be fully restored by exploding budget deficits or by exports.

**2. Policy and Reform**

*"Implicit in the legislation which I am suggesting to you is a declaration of national policy. This policy is that the broad interests of the Nation require that special safeguards should be thrown around home ownership as a guarantee of social and economic stability, and that to protect home owners from inequitable enforced liquidation in a time of general distress is a proper concern of the Government."* President Franklin D. Roosevelt (1933).

*"Sometimes financial crises are actually good because they cleanse the syste."* Marc Weidenmier, quoted by Nelson Schwartz (2007).

*"When Rome is burning, Emperor Nero must not benignly stand by fiddling, lest those careless with fire be encouraged toward future indiscretions. First things first. Teach lessons later. Later correct the bad regulating that encouraged and permitted excessively leveraged loans."* Paul Samuelson (2007).

*"There is substantial evidence that financial markets succeed because of strong enforcement and regulation, not in spite of it."* Linda Chatman Thomsen, Enforcement Chief for SEC, quoted in Carrie Johnson (2007).

Even as the financial crisis began to unfold, Wall Street mounted a major offensive against regulation to "secure America's competitiveness" (Johnson 2007). Fearing lawsuits by investors and wanting to protect accounting firms that had assisted in certifying the books of risky schemes, the Committee on Capital Markets Regulation (with the blessing of Treasury Secretary Henry Paulson) began its push to deregulate in fall 2006. The most important agenda items are to make it more difficult to pursue shareholder lawsuits and to repeal some sections of Sarbanes-Oxley, including the requirement that companies must review their safeguards that are designed to prevent fraud and mistakes. Deputy Assistant Attorney General Barry Sabin responded that "Eliminating fraud is good for business" (Johnson 2007). Given the scope of the unfolding crisis, it is not clear that Wall Street will be able to hold off a growing demand for reregulation, because, as recognized by David Chavern (executive at the Chamber) "Almost all significant laws and regulations are done in this country in times of crisis" (Johnson 2007). The best example, of course was the policy response to the Great Depression.

There are two immediate policy issues facing us: first, what, if anything can be done to ameliorate the fall-out from the current crisis; second, what can be done to prevent recurrence of such a situation in the future? Both of these issues will require much study and debate. I can only offer some general statements that might warrant further research.

a) Policy to deal with the current crisis.

There are a number of initiatives designed to deal with the current crisis, some coming from the private sector while others are being pushed by policy makers. Among those considered are:

- As discussed above, the financial sector is setting up funds to maintain liquid markets for mortgage securities and asset-backed commercial paper. The Treasury-facilitated plan is that banks would put together $75 billion to stabilize prices. This is probably a good idea, although it will be successful only if losses can be contained—a rather unlikely scenario.
- The Fed has lowered interest rates. This is at least a movement in the right direction, although it will not help much. Because three-quarters of subprime

VARs have pre-payment penalties (averaging six months interest payment on 80% of the original principle value), borrowers usually cannot afford to get out of their loans, thus, lower interest rates are not going to provide much relief to borrowers, and they only temporarily settle financial markets. Each rate cut is met with relief, but the market then clamors for another. As discussed below, resets must be limited and postponed.

- Time and economic growth go a long way in restoring financial health—if incomes can grow sufficiently, it becomes easier to service debt. This will require growth of aggregate demand. Recent growth has been fueled by exports, partly thanks to a depreciating dollar. Any U.S. slowdown will, however, be contagious and hurt exports. The private sector cannot be the main source of demand stimulus. The problem is that while the budget deficit will increase as the economy slows, this results from deterioration of employment and income (which lowers taxes and increases transfers)—thus it will not proactively create growth although it will help to constrain the depths of recession. It is not likely that the President and Congress (even with a change of administration) will embark on spending programs or big tax cuts. It is difficult to see how the U.S. can grow its way out of this problem.
- The House of Representatives is proposing legislation that would allow bankruptcy judges to modify mortgage terms to allow people to keep their homes. Congress needs to go farther, however. The recent "reform" of bankruptcy law was passed just in time to make it difficult to resolve this crisis, because current code prohibits relief from mortgage debt. Thus, this law must be amended to allow those who had been subjected to predatory lending to escape subprime loans. Borrowers should only need to show that inability to service the debt is not their fault—that is, that they have a loan that the lender should have known they would not be able to service out of their incomes and assets at the time the loan was made. Whether the lender had that information is not relevant. The borrower should then be able to refinance the home at its current market value, and with the borrower's original equity (if any) intact. Only if the creditor can show that the borrower had defrauded the originator (through, for example, doctored W-2 forms

or bank account statements) would the borrower be held liable for the original loan. The amendments to the bankruptcy code might be limited in application to loans for primary residences only, and up to a limited home value (such as median price for the SMSA). As President Roosevelt argued in announcing his plan to save the "small homes," the goal would be to preserve homeownership, not to protect real estate speculators. The FHA and GSEs would be instructed to take the lead in refinancing these homes. The problem is that Fannie and Freddie are already experiencing their own problems. Freddie, itself, holds a huge volume of securitized subprimes, and has written these down from par to 90%—however the AGX indices indicate they are worth only 70 or less. Freddie is also already below minimum capital requirements. (Veneroso 2007b).

- The Treasury is working with the mortgage industry to freeze interest rates, so that those who can afford mortgages before resets occur can keep their homes. (Reuters 2007c). This differs from the proposal made in the previous point, as it writes off as lost causes those who were enticed to take out loans they could not afford from the get-go. This is not equitable—brokers and other lenders should bear the costs of pushing expensive debt, and homeowners should be offered terms for which they *would* have qualified at the time the loan was originally made. Further, as Bianco (2007) has shown, most "teaser rate" hybrid loans have already reset (over 99% of the adjustable-rate mortgages with an initial interest rate of less than 3% had already reset by August 2007, with only 235,000 such mortgages left to reset in 2008 and beyond). Because almost half of all ARMs originated between 2004 and 2006 had reset by August, freezing rates on those mortgages is like closing the gate after the cows have escaped. Interest rate relief needs to be made retroactive. Admittedly, this is not easy due to the nature of the contracts.
- Roosevelt created an RFC-like agency, the Home Owners' Loan Corporation (HOLC), to take on the tasks of saving small homeowners. This successfully refinanced 20% of the nation's mortgages, issuing bonds to raise the funds. While about 20% of those loans eventually were foreclosed, the HOLC actually managed to earn a small surplus on its activities, which was paid to the Treasury

when it was liquidated in 1951 (Pollock 2007). Clearly, there are lessons to be learned from that experience: refinance is preferable to foreclosure as it preserves homeownership and communities, while also saving money in the process.

- The JEC has also called for counseling of delinquent borrowers to prevent foreclosure. The federal government should provide the funds initially, and should sue predatory lenders to recover costs. Governor Schwarzenegger of California has allocated $1.2 million for a statewide public awareness program to inform homeowners about alternatives to foreclosure (Lifsher 2007).
- It appears that financial markets are expecting the federal government to step in should the subprime crisis spread to other securities, such as the muni bond market. Geraud Charpin of UBS AG wrote to investors that "A form of bailout would probably be worked out. A politically engineered solution will insure an acceptable way out where the innocent pensioner does not lose out and states are able to continue funding themselves and build more roads and schools" (quoted in Richard and Gutscher 2007). Of course, bail-outs validate bad behavior and encourage worse. However, Minsky (like Samuelson) would argue that a financial crisis is not the correct time to try to teach markets a lesson by allowing defaults to snowball until a generalized debt deflation and depression can "cleanse" the system. There is a fine line that must be walked, allowing the worst abusers (and especially the perpetrators of fraud) to lose while protecting the relatively innocent. Probably no one has put it any better than Mayor Abramson of Louisville, Kentucky when speaking about foreclosures in our nation's cities: "We're trying to find the individual who ultimately sold that mortgage to, or packaged it and now it's at Countrywide, or it's Wells Fargo, or it's Deutsche Bank, or U.S. National Bank, none of which have locations in most of our cities…. We'd like to see the Wall Street syndicators, who made enormous amounts of money off these exotic packagings that they've developed, work with their servicing organizations, like the Wells Fargos and the Countrywides, to give them the flexibility necessary to work with American citizens to get through this crisis by, if having to, leave the interest [rate] where it is, put the extra dollars on the back of the loan, and allow the folks to continue to live in the property,

maintain the property, and keep the neighborhoods stable." Mayor Jerry Abramson, Louisville, Kentucky (Marketplace 2007).

Because financial markets cannot be allowed to learn lessons "the hard way," regulations and oversight must be strengthened to slow the next stampede toward a speculative bubble. We turn to such concerns in the next section.

b) Policy to prevent "it" from happening again.

As Shiller (2007) argues, the housing downturn of 1925-33, during which housing prices fell by 30%, provided an opportunity for a revolutionary policy response that restructured the housing sector in a manner that made it robust for two generations. This was also a major theme in Minsky's work. Reforms included creation of the Federal Home Loan Bank System that would discount mortgages in lender of last resort interventions modeled on the Federal Reserve System, and the creation of the Home Owners Loan Corporation (discussed above) to refinance mortgages. The real estate appraisal industry established the Appraisal Institute to create professional, national standards; Congress modified bankruptcy law to extend protection to homeownership; and the Federal Deposit Insurance Corporation was created to protect deposits and prevent runs that would close financial institutions that made mortgage loans. The Federal Housing Administration was created, which transformed the typical mortgage, from a very short (five year) loan with a balloon payment to the long-term fixed-rate, self-amortizing mortgage that two generations of Americans grew up with. Finally, Fannie Mae was created in 1938 to increase the supply of mortgages to households of moderate and middle-income means, to encourage standardization of terms and to guarantee mortgages. Shiller (2007) characterizes the official policy response today as "anemic in comparison," argues that we should be prepared for a housing collapse as large as that of 1925-33, and calls for thinking about big and fundamental changes to put the real estate sector back on more secure footing. In this section we examine policy changes to prevent Minsky's "it" from happening again.

- Congress is considering regulations on mortgage originators that would establish new licensing requirements, put restrictions on incentives for saddling borrowers with riskier loans, and provide liability for financial institutions that sell

mortgages (Hulse 2007). In addition, Congress would set new standards to be met by originators regarding ability of borrowers to make payments. Unfortunately, it is not clear that Congress will apply these rules to state licensed mortgage brokers. Predictably, the mortgage industry has attacked the legislation as too intrusive. Consumer groups correctly argue that the proposals do not go far enough. The California State Assembly is also considering legislation to ban predatory lending practices, such as yield-spread premiums that induce brokers to push high interest rate loans (Lifsher 2007).

- Unscrupulous lending was a big part of the subprime boom, with little oversight of mortgage brokers and with substantial incentive to induce borrowers to take on more debt than they could handle, at interest rates that would reset at a level virtually guaranteed to generate delinquencies. The evidence is overwhelming that variable rate loans lead to more foreclosures; hybrid VARs are even more dangerous. There is a proper place for VARs and hybrid VARs, but not with the typical subprime borrower who has little reserve if things go bad. Speculative property "flippers" might not need protection from these risky financial instruments, but low income borrowers, and first-time buyers do. Congress should investigate limits to marketing of VARs and hybrids to low income borrowers and first time buyers.
- Pollock has called for a simple, standard, one-page disclosure of the loan terms, written in plain English. This summary should explicitly show all of the fees as well as the monthly payment under all likely scenarios (for example, after interest rate reset, and after the borrower's credit score deteriorates due to missed payments). Prepayment fees should be shown and explained. The primary borrower financial characteristics on which the loan is made should be shown—income, assets, down payment—as well as the home's market-assessed value and the loan to value ratio. The loan originator must sign a statement indicating that due diligence has been made to ensure accuracy of the disclosure. As the current crisis demonstrates, quick profits can be made for originators by duping borrowers and security purchasers, but social costs are too high to permit this to happen again.

- Predatory lending practices should be identified and banned. Predatory practices should be defined to include large pre-payment penalties, low "teaser" rates that reset at much higher rates, knowingly inducing a borrower to agree to a higher interest rate than justified by the credit score, no doc and low doc loans, liar loans, and loan terms that the borrower will not be able to meet. Restrictions should be tighter when lending for a primary residence, than for a second or vacation home, or for commercial real estate. Ponzi and speculative loans (that rely on home price appreciation for validation) should not be permitted in the case of first time buyers, indeed, probably should not be permitted at all in the case of purchases of primary residences.
- Mortgage brokers must be supervised and regulated. Given that they originate mortgages that will be sold in national and international markets, federal oversight is necessary. Exactly what division in responsibilities will be made between state and federal supervision requires further study.
- As Martin Wolf and Henry Kaufman put it, fear must be reintroduced into markets. According to Kaufman, "It is therefore urgent that the Fed take the lead in formulating a monetary policy approach that strikes a balance between market discipline and government regulation. Until it does so, we will continue to see shocks of even greater intensity than the one now radiating outward from the quake in the U.S. subprime mortgage market." (Kaufman 2007). Increased federal funding of investigation of fraud would help to strike some fear into the hearts of Wall Street.
- There should be losses, but, again, there must also be protection for the financial system as a whole and for the "innocent." Separating the "guilty" from the "wives and orphans" will not be easy—and the policy bias to save the system will mean that many of the guilty will have their losses "socialized." Where possible, policy should protect holders of financial institution liabilities but not the holders of equity. Policy should also avoid promotion of financial institution consolidation—a natural result of financial crises that can be boosted by policy-arranged bail-outs. Minsky always preferred policy that would promote small-to-medium sized financial institutions. Unfortunately, policy makers who are biased toward "free

markets" instinctively prefer to use public money to subsidize private institution take-overs of failing financial firms. The Roosevelt alternative should be adopted: temporary "nationalization" of failing institutions with a view to eventually return them to the private sector at a small profit to the U.S.Treasury. This is what Minsky advocated during the thrift crisis of the 1980s, but the administration of President Bush, senior, chose industry consolidation and public assumption of bad assets that resulted in Treasury losses. Policy should instead foster competition, with a bias against consolidation.

## CONCLUSION: WHAT WE LEARNED FROM MINSKY

*"Have I learned from my mistakes? Yes, I believe I could repeat them all exactly the same."* Attributed to Kurt Vonnegut.

In response to the spreading subprime meltdown, the Bank of England has advocated "a greater focus on liquidity management, more rigorous stress testing, greater transparency in the composition and valuation of structured products and improved disclosure on institutions' risk exposures, including to off balance sheet vehicles" (Bank of England 2007). While these recommendations are surely welcome, they would have had little effect on the current outcome even if they had been in place in 2000. Notably absent is any enhanced regulation and oversight by central banks and other government supervisors, as the recommendations merely reflect the currently fashionable belief that if only markets function smoothly and with better information, all will be fine. This would perhaps work if the financial system were fundamentally stable.

Minsky, however, insisted that market processes are fundamentally destabilizing—an instability that is not due to inadequate transparency. The fundamental instability is upward—toward a euphoric expansion that cannot be tamed by better information or lower transactions costs. Indeed, even the Bank of England's own report makes it clear that in spite of warnings from "the Bank, the FSA and other official sector institutions" as well as from "market contacts" that risk was vastly underpriced, those operating in markets "were afraid to stand against the tide for fear of losing market

share"[22] (Bank of England 2007). Those familiar with Keynes will recall his statement that it is better to fail conventionally than to swim against the tide. Thus, one cannot look to market "reforms" for solutions to systemic problems—and blaming market participants for short-sightedness is not helpful.

Minsky used to argue that the Great Depression represented a failure of the small-government, Laissez-faire economic model, while the New Deal promoted a Big Government/Big Bank highly successful model for financial capitalism. The current crisis just as convincingly represents a failure of the big-government, neoconservative (or, outside the U.S., what is called the neo-liberal) model. This model promotes deregulation, reduced supervision and oversight, privatization, and consolidation of market power. In the U.S., there has been a long run trend that favors "markets" over "banks," that has also played into the hands of neoconservatives. The current housing finance crisis is a prime example of the damage that can be done. The New Deal reforms transformed housing finance into a very safe, protected, business based on (mostly) small, local financial institutions that knew their markets and their borrowers. Homeownership was promoted through long term, fixed rate, self-amortizing mortgages. Communities benefited, and households built wealth that provided a path toward middle class lifestyles (including college educations for baby-boomers and secure retirement for their parents). This required oversight by regulators, FDIC and FSLIC deposit insurance, and a commitment to relatively stable interest rates. The Big Government/Neocon model, by contrast, replaced the New Deal reforms with self-supervision of markets, with greater reliance on "personal responsibility" as safety nets were shredded, and with monetary and fiscal policy that is biased against maintenance of full employment and adequate growth to generate rising living standards for most Americans. The model is in trouble—and not

[22] It is interesting that Northern Rock, the "poster child" for the spread of the U.S. subprime problems to the rest of the world, began as a mutual-form building society but converted to a stock-form U.K. bank in 1997. After conversion, it grew quickly with liabilities increasing from about 20 billion pounds in 1998 to nearly 120 billions in 2007. Those familiar with the US thrift crisis will notice the similarity: thrifts converted from mutuals after 1974, and then grew rapidly during the 1980s before spectacular failures that decimated the whole thrift industry. Northern Rock also proved that anything less than 100% deposit coverage is meaningless when a financial institution's solvency is called into question—with coverage equal to only 90%, Northern Rock faced a bank run that was calmed only when the government agreed to provide 100% coverage of deposits (remarkably, the Treasury agreed to indemnify the "Bank [Bank of England] against any losses and other liabilities arising from its role in providing finance to Northern Rock")—which was extended to all other financial institutions that might face liquidity problems. (Bank of England 2007).

just with respect to the mortgage mess, as the U.S. faces record inequality and destruction of the middle class, a healthcare crisis, an incarceration disaster, and other problems beyond the scope of this analysis (See Wray 2005 and Wray 2000).

Minsky's work provides guidance for development of a new model that is consistent with current realities. He teaches us that the modern financially complex economy is prone to speculative booms. Financial innovations stretch liquidity and increase leverage in a way that endangers solvency. Unfortunately, periods of relative stability hasten the process, encouraging the development of financially fragile structures. The Big Government and Big Bank help to put ceilings and floors on demand and income, as well as on asset prices. Again, however, by reducing volatility, leveraging is encouraged. Further, from his earliest work, Minsky recognized that private-led expansions are inherently more prone to creation of financial fragility because they imply deterioration of private balance sheets as borrowing tends to increase faster than ability to service debt out of income. For this reason, he advocated policy that would encourage consumption, but with a major impetus for growth coming from government spending. A government-led expansion would actually improve private sector balance sheets.

Minsky never really addressed a situation such as the one we have experienced since 1996, in which households consistently spend more than their incomes—although this analysis has shown that his work on financial instability can be extended to cover household finance. The housing sector boom has occurred in conjunction with a consumption-led boom (indeed the two were linked, as discussed), thus, household balance sheets have been doubly affected. Clearly, this is not a sustainable model for the long run, although it was sustained over the medium term by a confluence of supporting influences. Big government deficits kicked-in at the right time during the recession early this decade, to prop up income so that the consumption boom could resume. Socialization of risk through Big Bank (Fed) intervention helped to limit losses in financial markets in the increasingly frequent and severe financial crises experienced over the past two decades. Freeing financial markets and validating innovations increased the supply of credit to households, permitting what would have been otherwise impossibly stretched finances. However, all of this is leading to the inevitable crash.

We must return to a more sensible model, with enhanced oversight of financial institutions. We need to recreate a housing finance model that promotes stability rather than speculation. We need policy that promotes rising wages for the bottom half (or even three-quarters) of workers so that borrowing is less necessary to maintain middle class living standards. We need policy that promotes employment, rather than transfer payments—or worse, incarceration—for those left behind. Monetary policy must be turned away from using rate hikes to pre-empt inflation and toward a proper role: stabilizing interest rates, direct credit controls to prevent runaway speculation, and supervision. Minsky advocated support for small banks, and creation of a system of community development banks—the latter only partially achieved under President Clinton—as a viable alternative to the predatory lending practices that *did* increase the supply of credit to low income borrowers and neighborhoods, but which is resulting in foreclosures and vacancies.[23] As Keynes (1964) said, "Speculators may do no harm as bubbles on a steady stream of enterprise. But the position is serious when enterprise becomes the bubble on a whirlpool of speculation. When the capital development of a country becomes a by-product of the activities of a casino, the job is likely to be ill-done." Unfortunately, we turned American home finance over to Wall Street, which operated the industry as if it were a casino. Keynes warned that "It is usually agreed that casinos should, in the public interest, be inaccessible and expensive." Instead, the price of admission to the American mortgage casino was cheap, but the potential losses are huge. Minsky called for "the creation of new economic institutions which constrain the impact of uncertainty is necessary," arguing that the "aim of policy is to assure that the economic prerequisites for sustaining the civil and civilized standards of an open liberal society exist. If amplified uncertainty and extremes in income maldistribution and social inequalities attenuate the economic underpinnings of democracy, then the market behavior that creates these conditions has to be constrained" (Minsky 1996).

[23] See Papadimitriou and Wray (1998) for a summary of Minsky's policy proposals.

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