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Ending Government Bailouts As We Know Them

Hoover Institution, Stanford University

THE FINANCIAL CRISIS: CAUSES AND LESSONS

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Part I – The Crisis

This policy workshop is occasioned quite obviously by the events of the last several years and the enormous expenditures that resulted, as losses cascaded through the financial system (and beyond) and governments shifted those losses to taxpayers in an effort to combat a severe recession or worse. There is now agreement by all that this experience should not be repeated, but the first step is to understand how such huge losses were created. Can we institute some regulatory reforms that give us confidence that it will be prevented from happening again? Are there better ways to deal with the problem of financial institutions that are "too big to fail"?

A lot happened even before the perceived beginning of this crisis in 2007,

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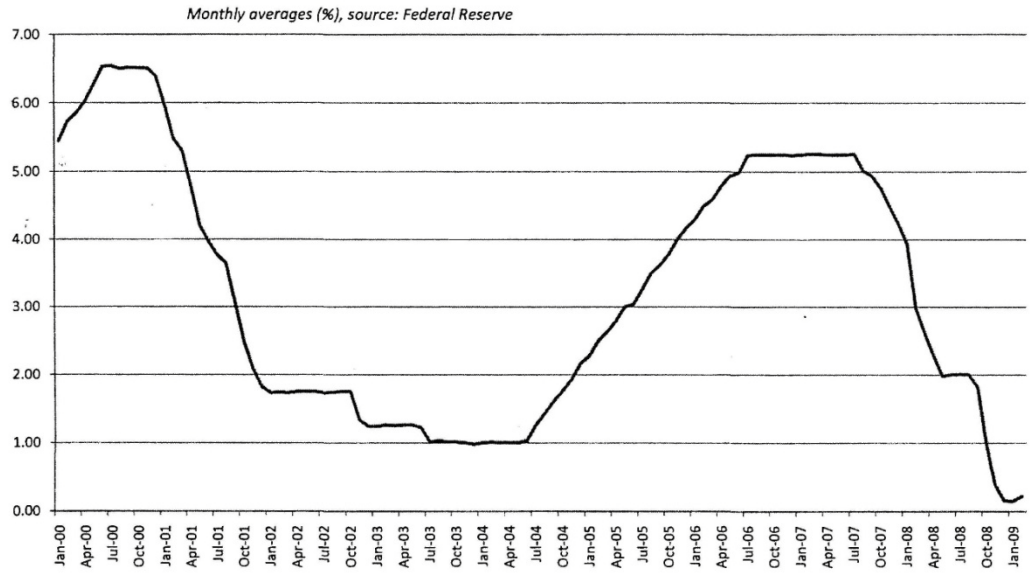
so although the events are recent, I will review the period from 2001 to date, as part of our inquiry into the lessons to be learned. Much of it is probably familiar, but worth revisiting.

This necessarily simplified account is divided into 3 stages: first, a look at the key factors that led to the increasing riskiness of US home mortgages; second, how those risks were transmitted as securities from US housing lenders to institutional investors around the globe; and third, how those risks led to huge losses and created a credit crunch that moved the impact from the financial economy to the real economy. The goal is to lay a factual foundation for deriving the lessons that ought to be taken away from this very expensive experience.

I. CAUSATION

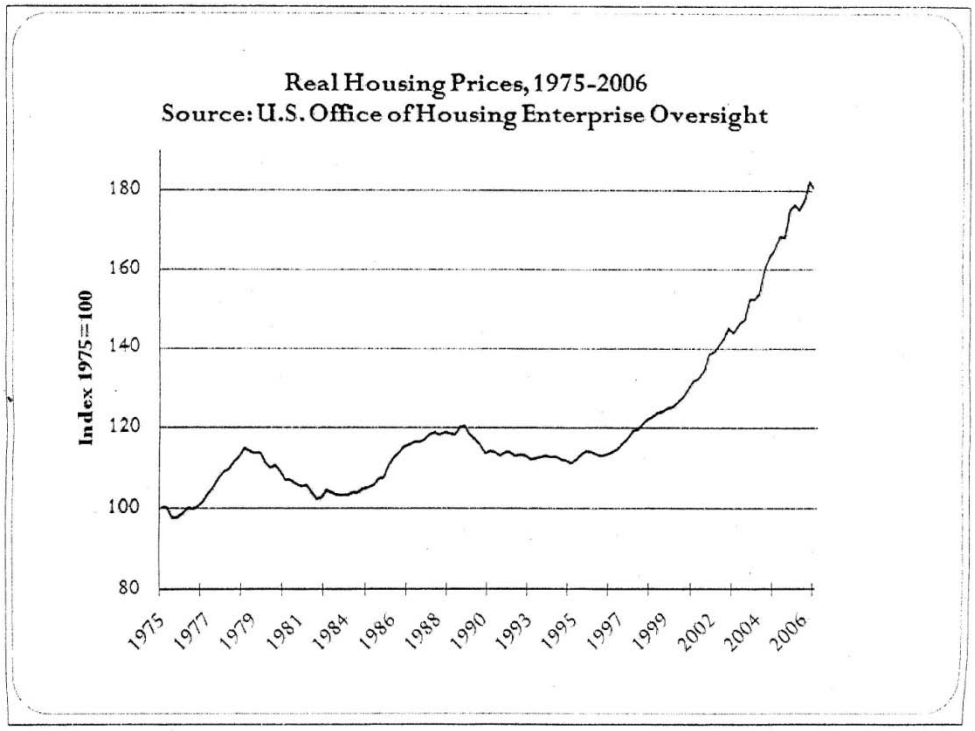
Starting points in an historical account are somewhat arbitrary, but I will begin with the monetary policy followed by the Fed after the dot.com bust of 2000. Concerned about deflation and the Japanese stagnation of the 1990s, the Fed in 2001 abruptly lowered its target rate from 6.5% to under 2%, and then kept it at 1% until July of 2004, as shown in Slide 1. The inflation rate over this period was around 2%, so the real rate of interest was negative. Needless to say, borrowing by both businesses and households was greatly stimulated.

Federal Funds Effective Rate



Slide 1

For most households, the largest and most heavily debt financed purchase they will ever make is to buy a home, so housing demand in particular is rate sensitive and responded strongly to the monetary stimulus. With plentiful and cheap liquidity, some of it also coming from the trade surplus investments of the Asian export economies, a steady increase in house prices was the result. Slide 2 shows house price appreciation (HPA) in the US since 1975.



Slide 2

US housing policy for some time has been to encourage home ownership, and a number of government agencies were formed to support housing finance. Government Sponsored Enterprises or GSEs (Fannie and Freddie) would insure residential mortgages that met their standards, for a fee. They would also buy the loans and put them into a pool, which could then be sold to private investors, thereby providing funds for additional purchases from banks and mortgage originators. The GSEs thus led the way for the development of a securitization market for conventional mortgages.

Congress from about 1977 on embarked on a program to expand mortgage lending to minorities and LMIs (low and moderate income groups). It began modestly with the Community Reinvestment Act, to prevent "redlining" of

certain urban areas in which a bank was allegedly refusing to lend at all, but shifted in 1995 to measuring the volume of loans to LMI borrowers by banks and then to establishing ever-growing "targets" (beginning at 30% and ultimately reaching 55%) for the percentage of "affordable housing" loans in all those bought or guaranteed by the GSEs. The goal was to push home ownership rates ever higher, and it involved pushing credit standards ever lower.

The process reached its zenith after the creation and promotion of "subprime" loans – loans to borrowers with poor credit scores (<660), multiple recent mortgage delinquencies or foreclosures, DSIs (debt service to income ratios) of >50%, and the like. With a somewhat better credit score, the loans were called "Alt-A". Conventional down payment requirements of 20% dropped to as low as 3.5% for the GSEs (and to zero for some private originators), because significant down payments were viewed as "barriers" for low-income families.

New products were invented, to make mortgages more "affordable" for buyers with very limited income or resources, and for owners drawing out their equity in refinancing. Adjustable rate mortgages (ARMs) evolved into "hybrid" ARMs with low initial rates which would reset to market rates after two or three years, or "option" ARMs in which the buyer could chose the monthly payment. Interest-only (IO) loans involved no amortization of principal for a period of 10 or 15 years. Down payments could be borrowed through a second mortgage. Approval processes were automated; income statements were not verified, and such 'no-doc' loans became commonplace.

The private sector entered subprime lending in a large way, selling the mortgages not only to the GSEs but into a burgeoning private securitization market. [Private (non-GSE backed) issuance of subprime and Alt-A securities amounted to around $560 billion in 2004, $830 billion in 2005, $840 billion in 2006, and $470 billion in 2007 (with only $4 billion in 2008), for a total of about $2.7 trillion.]

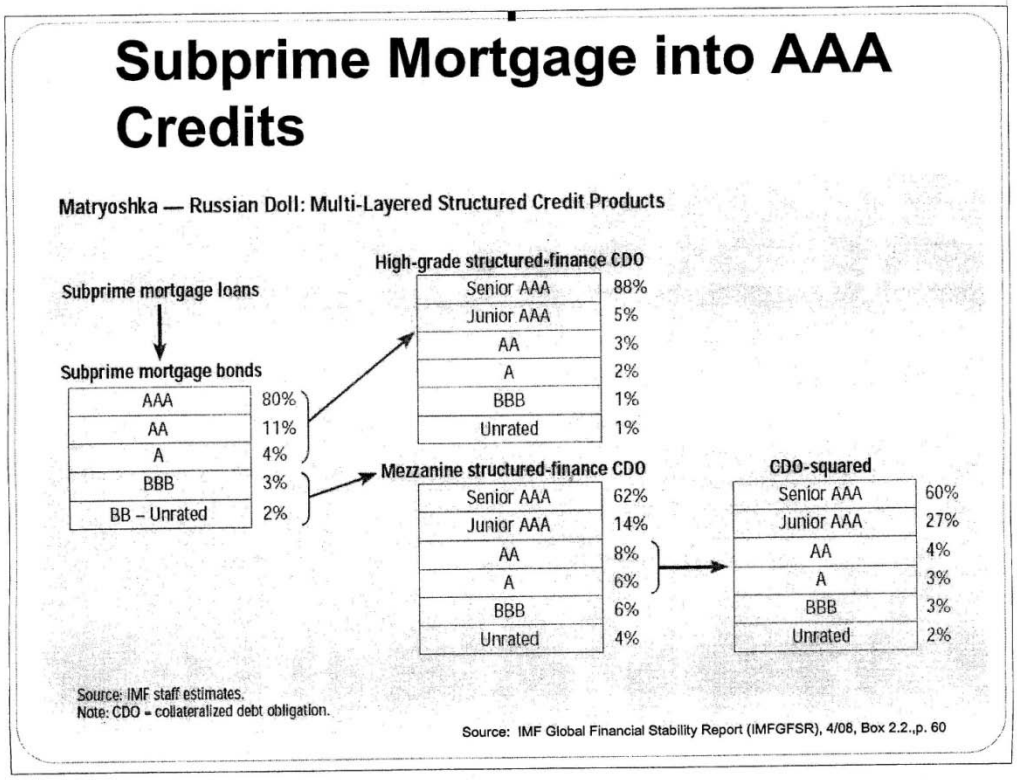
Was all of this based on "predatory lending" or borrower fraud? No doubt one can find an amount of misrepresentation on both sides, but that is not really the story. Both borrowers and lenders were expecting HPA to create some equity and enable a sale or refinance of the property when the resets hit, and under those circumstances they were both acting quite rationally without any need for deception. Borrowers, with little or no down payments (or remaining equity), had nothing much to lose financially. (Indeed in about half the states, mortgage loans are legally non-recourse; the buyer can walk away without any personal liability.) In effect, buyers were renting at the low initial rates, with an option to purchase at the reset date. Mortgage originators or lenders were not keeping the credit risk, but selling it into investor pools, which I next examine.

II. TRANSMISSION

Mortgage securitization had begun simply, with bundling of conventional mortgages insured by a GSE into a pool, shares in which could be sold to investors as reasonably safe securities with the borrowers diversified across geographical regions and economies. But with the advent of an increasing volume of subprime mortgages, it became more complicated. Investors wanted higher returns, but they also wanted safety. (A first principle of finance theory is

that they move in opposite directions, but put that aside.) So, to simplify, claims on the cash flow of the residential mortgage-backed pools (RMBS) were divided into "tranches" or levels of seniority, with those at the bottom first to take losses or shortfalls in payments and those at the top holding first claims viewed as quite secure, with relatively low contractual return entitlements and AAA ratings.

It was not difficult to sell the AAA tranches, but there was less demand for lower ratings. The solution: put the lower tranches into a new pool combined with the tranches of a hundred other pools, and create a new hierarchy of claims in a collateralized mortgage obligations (CMO) pool. Then repeat the process, and add in some other kinds of consumer debt (auto loans, credit card loans, student loans, etc.) and perhaps some commercial loans, and form a collateralized debt obligations (CDO) pool. The process of creating asset-backed securities (ABS) need not, and did not, stop there. It continued into CDO^2 pools – as illustrated in Slide 3 – and SIVs.

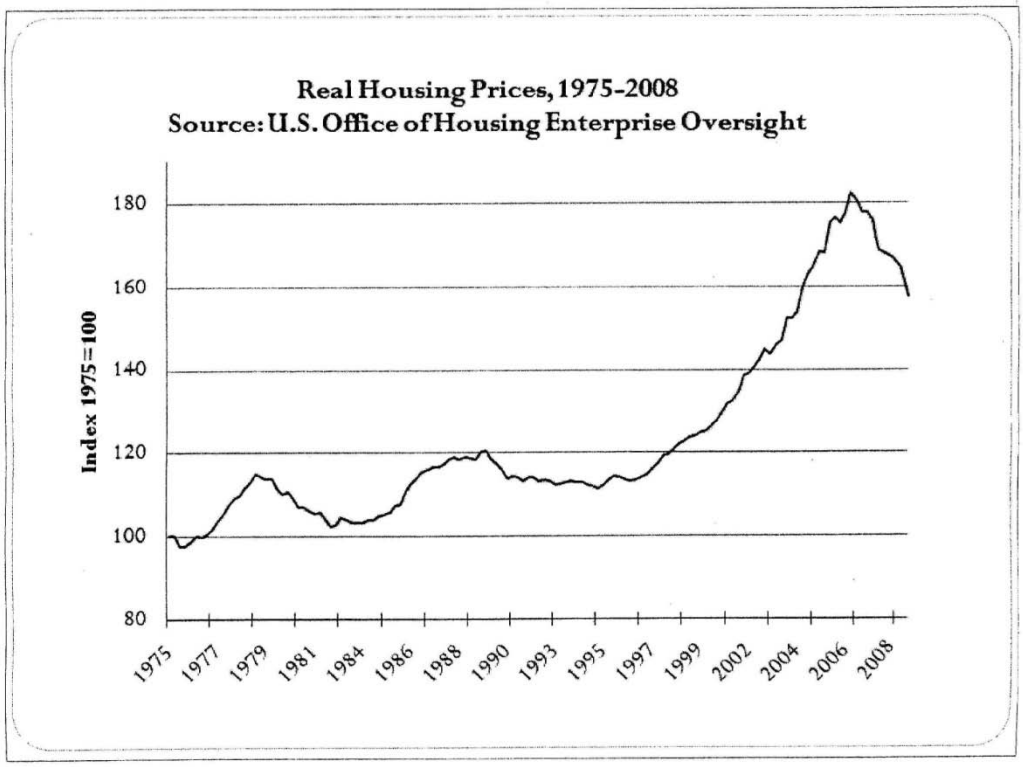


Slide 3

As you went down this securitization chain, the actual original loans underlying it all were becoming farther and farther removed from the securities held by investors. So to provide some reassurance and maintain the AAA ratings, various forms of "credit enhancement" were used. Municipal bond insurers ventured into insuring these new kinds of bonds; credit default swaps (CDS) were purchased to shift some of credit risk off investors. Reliable estimates are hard to come by, but aggregate issuances (2004-2008) of MBS securitizations (agency and private) may have amounted to something on the order of $9 trillion, bought up to their current regret by institutional investors all around the globe.

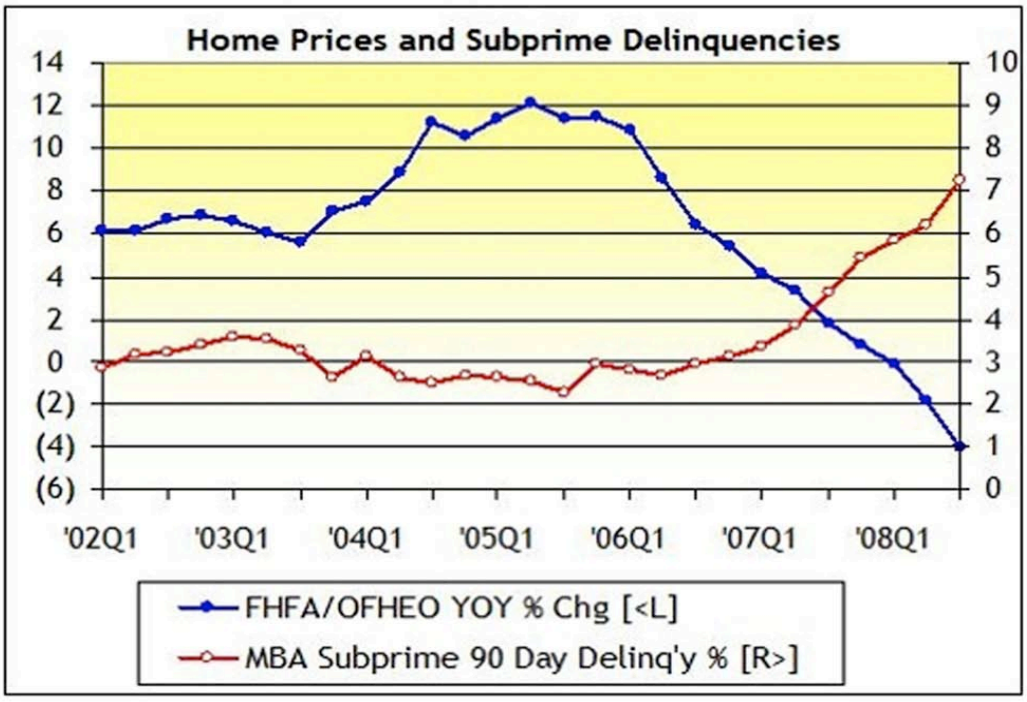
III. LOSSES

Six years or so of constantly accelerating HPA could not go on forever, as is true of any exponential function. The exact moment when a bubble will burst seems impossible to predict, but burst it did [Slide 4] at the end of 2006.



Slide 4

With house prices now falling and resets coming on line, subprime delinquencies began rising steeply [Slide 5], and the whole structure simply crumbled.



Source: Freddie Mac

Slide 5

House values quickly fell below the amount of the mortgage debt (since there was no significant downpayment cushion) and the embedded option was clearly out of the money. These "underwater" loans went into default and foreclosure, and the lower tranches of MBS pools incurred losses, while the upper tranches were obviously becoming more risky and hence declining in value.

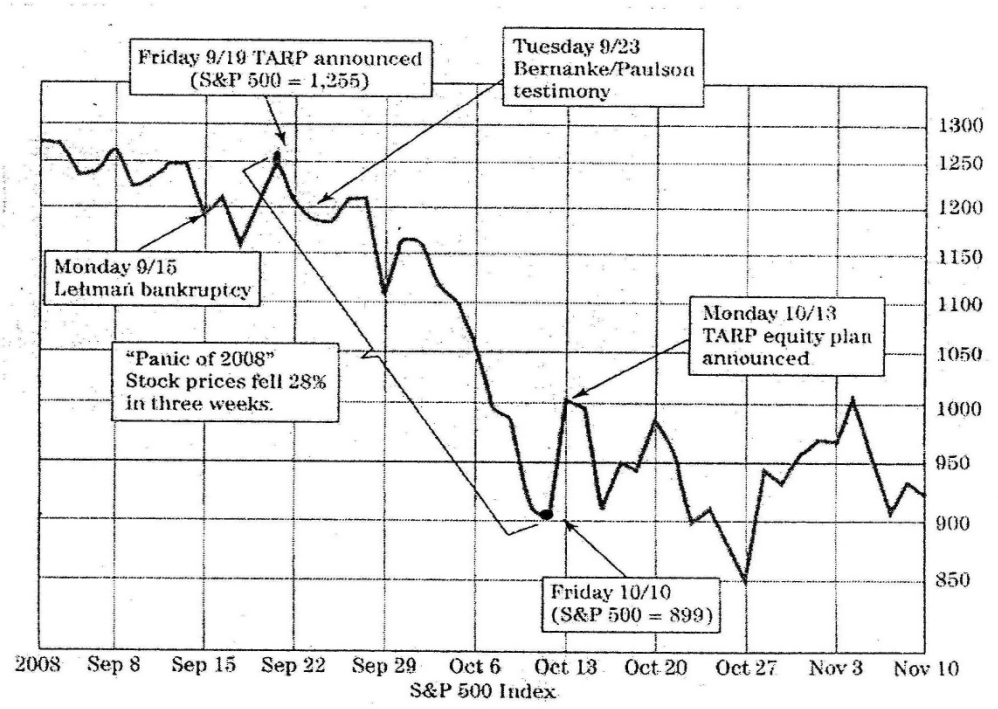
This process inevitably affected subsequent pools down the chain, but by how much? In a given MBS pool, one could observe the defaults and at least in theory use the information on thousands of borrowers to try to model future performance. But for subsequent pools, the information on the underlying original loans was lacking and the complexity made credible estimates of risks and losses nearly impossible, as I have written elsewhere [Attachment A]. The

rating agencies knew trouble was coming and in 2007 started downgrading more and more ABS issues. Their value became indeterminate and trading in them dried up, which eliminated external market prices, while their acceptability as collateral diminished accordingly.

What made the situation even worse was that there was poor disclosure of the positions held by the various investors in subprime loans and securities based on them – in particular, by commercial banks and investment banks, and some hedge funds. Those who had created these securities were among the largest holders. They were at the heart of the credit markets in the financial system, and they were with great reluctance announcing writedowns in their positions. The common belief was that both agency downgrades and bank writedowns were significantly lagging the actual loss of economic value, and hence there was a spreading concern with the solvency of counterparties among participants in the inter-bank and prime brokerage markets.

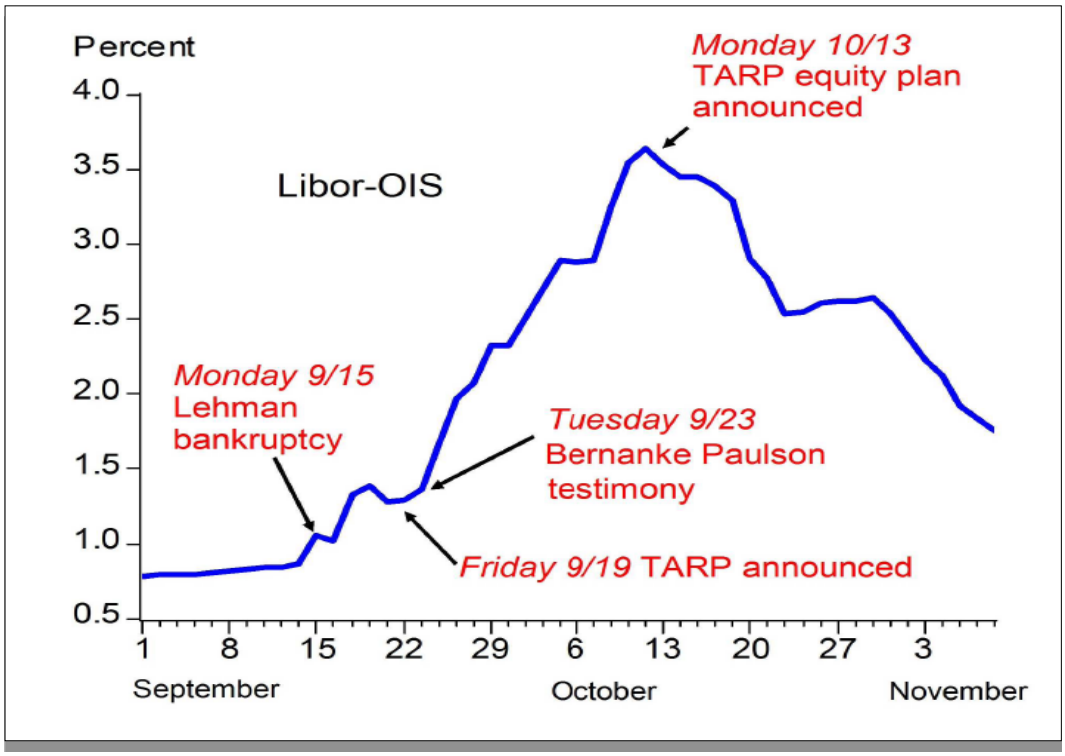
The growing appreciation of the seriousness of the problem throughout 2007 was followed by the dramatic failures of 2008, culminating in September: the GSEs (Fannie and Freddie), which owned or guaranteed $5.4 trillion of mortgage debt, were taken over and put into conservatorships on the 7th; Merrill Lynch was forced into acquisition by Bank of America on the 14th; Lehman filed for bankruptcy on the 15th; and the Fed made an $85 billion bailout loan to AIG on the 16th. On the 19th the Treasury Secretary announced a "bold approach" to "remove these illiquid assets that are…threatening our economy" and requested a massive appropriation to forestall a complete collapse; the effect on the market was immediate [Slides 6, 7]. Contrary to

popular lore, the Lehman failure and refusal to bail it out was not a fatal trigger but only one in a series of signals of the mounting magnitude of losses.



Source: J. Taylor & A. Weerapana, Principles of Economics 486 (6th ed. 2009)

Slide 6



Source: J. Taylor, Getting Off Track 27 (2009)

Slide 7

On Oct. 1 the $700 billion TARP bill was signed into law. The initial interpretation of increasing credit stringency throughout 2007 and 2008 was that MBS weren't trading because of a liquidity problem. The Fed constantly lowered its federal funds target rate (it is now close to 0), opened the discount window wide, and came up with a host of new lending facilities – but they still didn't trade. TARP was first conceived as a program to purchase MBS off bank balance sheets, but immediately ran into the valuation problem. So on Oct. 14 the Treasury converted it into a program to inject $250 billion into bank equity, in an effort to address concerns among banks over counterparty solvency.

Not surprisingly, credit cutoffs and insolvency fears spread from the financial sector into the real economy around the world, financing for business and international trade plummeted, and a severe recession was well underway. But it is not the purpose of this paper to examine the measures taken by various governments to deal with the consequences of the financial market crisis, and the effectiveness of the different remedies attempted. My focus is on the primary causes, and the ideas of how to prevent its reoccurrence, not on all the secondary effects.

Part II -- Lessons

What were the critical mistakes and deficiencies in the account we have just reviewed? The media, participants and politicians have put forth a host of favorite culprits, usually shifting blame to someone else: MBS securities, rating agencies, excessively compensated CEOs, CDSs, deregulation, greed, mark-to-market accounting, predatory lenders, repeal of Glass-Steagall, hybrid ARMs, short selling of bank stocks, borrower fraud, dishonest mortgage brokers, inadequate consumer protection for financial products, and so on. It would take a lot more time than I have to try to deal with each of them, and it's probably unnecessary. Some are minor factors or even irrelevant to the crisis, whatever their independent merits, but I will try to take up the more salient in three broad categories: defects in financial products, defects in risk management, and defects in government policy.

I. FINANCIAL PRODUCTS

CDS, or derivatives in general, have received a lot of the blame for the crisis. But CDS created none of the losses borne by subprime lenders or mortgage investors. They are an instrument for transferring, and thereby spreading, some of the risk, and they worked as designed. The CDS in the Lehman failure, and in the GSEs and others, were all settled and paid promptly. (In addition, they served as a good measure of changing risk perceptions.) Of course, AIG wrote far too many customized CDS on MBS for too low a price, but that was a defect in judgment, not in the derivative instrument.

Subprime lending often took the form of hybrid loans, with low initial rates and resets after two or three years to market rates, and borrower income was ignored or not checked. In effect, mortgage lending became collateral-based rather than borrower-based. There is nothing intrinsically unsound about lending on collateral, but lending on collateral-appreciation was the real problem. The Fed in 2008 reacted by prohibiting subprime loans without regard to ability to repay from income or net worth. Data show that the best predictors of default are the size of the downpayment and credit history – factors that are politically sensitive and not addressed by the new rule.

The subprime loan problem was magnified by the securitization process, so should securitization be banned – for example, by permitting banks to issue covered bonds but not form ABS pools? Pools offer wide diversification across localities and borrower characteristics, raise capital and shift risk from the banking system to other institutional investors (as do CDS). (But in a recession, the correlation between mortgage loans and other forms of consumer credit proved much higher than anticipated, so the diversification benefit was modest.)

The greater difficulty as already noted was that the complexity, created as tranches went down the line from the original RMBS pool into additional layers of pools, rendered the securities "toxic" – incapable of being reliably valued or sold. In my view, the remedy for that is clear if challenging. It is not clear that such a degree of complexity is economically warranted or will revive. But to whatever extent securitization does revive, one change seems essential.

The SEC could by rule mandate detailed disclosure of the characteristics and performance of all loans in original pools and all tranches in subsequent ones, which would then be aggregated in a central data repository available to all. This would enable rating agencies (and others) to model the initial risk and adjust to monthly performance information. It would also facilitate evaluation of rating agency performance and the entry of new competitors who believed they had superior models. Various detailed proposals along these lines exist, but they are yet to be implemented.

II. FIRM RISK MANAGEMENT

It is obvious that there was almost universal underestimation of the risks being incurred. Some of it seems related to agency costs and incentive problems, but it goes beyond that. Does the answer lie in regulation, or corporate governance changes, or in a learning process that has already occurred?

Mortgage originators (brokers or bank affiliates) retained very little credit risk on the loans they made; they just took in fees and sold on the loans. The agency problem is evident, and contractual arrangements tried to bound it with representations and warranties, holding periods, and put-back clauses. They

didn't work very well, because they were poorly drafted and many of the brokers had very thin capital in relation to their loan volume. The GSEs automated their acceptance process to meet their constantly rising "targets", and lost the ability to monitor underwriting effectively, while the banks formed pools in 'bankruptcy-remote' entities and sold on the ownership of credit risk. Or so they believed, until they found themselves with large holdings on their own balance sheets, and having for reputational concerns to take back responsibility for some of their SPEs (special purpose entities).

The SPE accounting rules are now changed, acceptable mortgage originators now have to hold loans for longer periods and have higher capital margins, and the CEOs who oversaw these operations have now mostly lost their jobs and a great deal of their net worth. So some lessons have in fact already been learned, but why were they needed? There are several different theories.

One is that the top management in these giant financial institutions didn't understand what their underlings were doing. If that was the case, the compensation incentives to look at are not just those of the CEOs but those of the traders and lenders making the actual decisions. Their payouts should reflect the maturity or duration of their decisions' risk. To some extent that is already happening. But to focus attention on the level of compensation of top management (as opposed to the design of the incentive structure) panders to public anger while misidentifying the important issues.

Another is that deposit insurance and other features of the government safety net for banks (including bailouts), as well as the tax code, make debt

cheaper and thereby subsidized leverage and led bank management to take excessive risk quite rationally, regardless of its compensation structure. To offset this, supervisors rely on prudential regulation and capital requirements, but both have significant limitations, to be explored below.

Still another is that neither the top management nor those below understood that there was a bubble rising, though the HPA information was there for all to see, nor did they appreciate its implications. If that was the case, measures such as requiring the board to oversee a chief risk officer, as has been suggested, may be of little help. It is hard to mandate foresight. Some urge that the solution is to have a government systemic risk regulator (SRR), and we'll turn to that below.

III. GOVERNMENT POLICY AND REGULATION

What role did government regulation and policies play in this sorry tale? There is a lot of media talk of deregulation, or regulatory gaps or loopholes, being the cause. What were they, exactly? It is necessary to distinguish between regulatory authority and regulatory performance, and I will begin with regulatory authority. My contention is that in most instances there was ample existing authority for US regulators to have addressed these issues, if they had perceived the need and acted on it.

Some point to the fact that derivatives were largely unregulated—which ones, and what was the critical missing requirement? There are only two prospects which figured in my prior tale:

1) MBS/ABS? They were not derivatives but securities, and always subject to regulation as such. I believe disclosure was inadequate in critical ways, but it was not because authority was lacking.

2) CDS? As noted, they were not a cause of losses in subprime mortgages or securities, but a mechanism to spread that risk. In doing so, they did create a potential for spillovers that sellers may have underestimated and inadequately hedged, but again those are among the secondary effects that are beyond the scope of this paper.

Some find a case for a new consolidated consumer financial protection agency, since that function is now divided in the US among a number of agencies. If by consumer we mean household investors, MBS/ABS were bought almost entirely by large institutions, not retail investors. If we mean borrowers, the Fed and other banking agencies had extensive regulations already on the books—so extensive that probably no one would argue that they could not be made more comprehensible. But again, a lack of authority is not the issue.

Was there insufficient authority to regulate the issuers of all those subprime mortgages and securities? Most all of them were made or funded by banks that were heavily regulated by the Fed or OCC or FDIC – it is hard to find an absence of authority to have imposed higher credit standards there. The question is why the legal authority wasn't used more effectively.

Some believe the capital requirements for banks were too low, so they should be increased, perhaps on a progressive scale for larger institutions. Of course, *ex post* it is clear that capital was too low in any insolvent institution, by

definition. But *ex ante,* how does one determine the proper amount to require? Under the Basel rules, a bank is "adequately capitalized" if it has a total risk-based capital ratio of at least 8%. The 8% number has no analytic foundation; it was simply the average ratio prevailing in the banking industry at the time. Banks are not "significantly undercapitalized" unless the ratio is below 6%, and not unless the ratio of tangible equity to total assets is below 2% are they viewed as "critically undercapitalized" in the US (and subject to imminent closure if more capital is not immediately raised).

When assets are "risk-adjusted" (downward) according to an elaborate schedule to determine a ratio denominator, it opens up opportunities for regulatory arbitrage. Of especial relevance to this analysis is the fact that residential mortgages were awarded a risk weight of only 50%, thus lowering the capital charge. But if a bank sold a portfolio of its mortgages to a MBS pool and received back an equivalent amount of AAA securities, the risk weight dropped to 20%. For a bank "adequately capitalized" at 8%, that meant the bank was required to carry only 1.6% of capital against the credit risk. That would not sustain much of a market downturn.

Of course, one could institute different risk weights or larger capitalization numbers. But whatever the number, it rests ultimately on the value of the assets, and this crisis has shown how questionable some of those values can be. Banks have strong incentives to overstate asset values and understate losses. Capital requirements are dependent on the reliability of measurements of asset values, and banks (aided by politicians in both the US and the EU) have pushed successfully against the accounting rules that would require marking assets to

current values and for accounting rules that would enable certain assets to be carried at historical cost despite subsequent adverse economic developments.

That renders reported capital ratios a very flawed indicator of economic risk and potential insolvency. A study of the 123 US banks that failed in 2008 and the first three quarters of 2009 found that, two quarters before the takeover, they had a median total risk-based capital ratio of 7% (and average of 9.4%), and that there was no statistically significant relationship between reported capital ratios and the losses to the Insurance Fund that FDIC estimated at the time of closure. Increased capital requirements and leverage limits might serve to reduce failures to some degree, but no one should underestimate the ability of banks to determine their own risk levels whatever the regulations say.

That leads us back to government policy and regulatory performance. This entire process began with very loose monetary policy, maintained for several years as the economy recovered from the dot.com bust, that created the foundation for a housing boom. It was fed by a government housing policy that continually pushed for lower lending standards to turn renters into home owners, even those whose marginal financial condition meant they could safely afford only rentals. This was in my view probably the most important single factor in the whole debacle. It came about because Congress desired to subsidize particular groups without direct on-budget expenditures but indirectly through regulation and guarantees – thereby denying the existence of any subsidization….until the whole scheme collapsed. And the benefit, to be compared to the enormous cost? The household home ownership percentage rose from 67.5% at the beginning of 2001 to 68.4% at the beginning of 2007; it is now back down to 67.6%.

IV. SYSTEMIC RISK REGULATION

Why did bank regulators and monetary policymakers and the Congressional housing committees get it so disastrously wrong? The currently popular answer is that what we needed was a Systemic Risk Regulator (SRR) and "macro-prudential" regulation. The SRR would collect vast amounts of information—rather unspecified—from very many quite large, "systemically important" firms—also unspecified. The SRR might issue advice or warnings about perceived developing risks or concentrations to financial firms and their regulators, which seems to be the EU approach. But in the US Administration version it would have sweeping powers to force those firms to alter their operations in some way, to prevent the occurrence of an event that might lead to systemic collapse. So there are two separate, and separable, parts of the concept, which we should examine. The US debate often seems to be about who or what would be the SRR, but that is probably not of great interest outside the Beltway, and I will put it aside. How would it work?

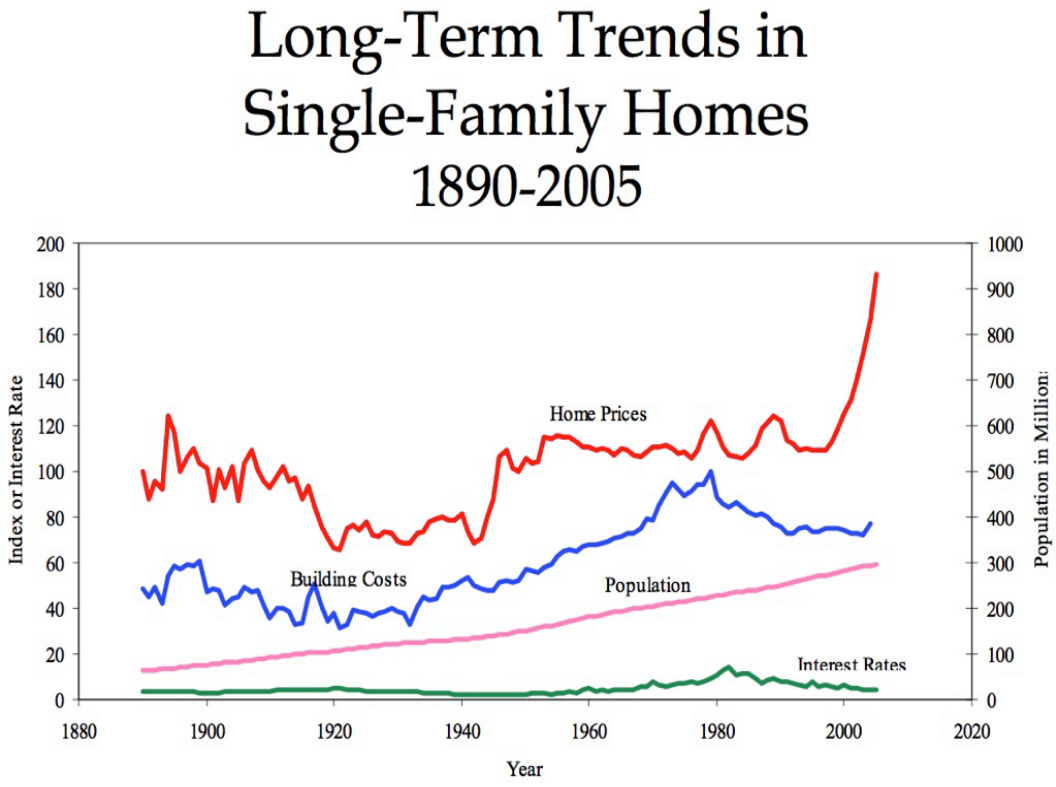
It is certainly feasible to impose extensive reporting requirements, if you know what you want and are indifferent to costs, on firms that you have somehow picked out as the ones that are 'systemically important'. And I agree with the proposition that the individual participants in this meltdown did not have sufficient information across various products about the holdings of others to help them assess the correlations and risk of their own positions and those of

potential counterparties, assuming they were given access to such detail. But there are two reservations:

1) I know of no macromodels of systemic risk that incorporate financial intermediaries. When the SRR gets all that required information, how can it reliably analyze it? How can it know that it has even gotten the right information?

2) Without a tested model and a fair degree of certitude, how does the SRR (in the strong version) successfully order those large systemically important firms to change their business operations or their financial structure? It is safe to predict that they would exert political counter pressure. Regulatory agencies in the past (and present) in the US have not been particularly bold in going counter to Congressional desires.

At a more basic level, is the real problem just one of information? What was the essential information that was not available to the Fed and bank regulators that would have led them to have forestalled the present crisis? The fundamental information about HPA, declining lending standards, and the growth of opaque MBS based securitization was no secret. [Slide 8] In hindsight of course it all becomes clear. But at the time, with a very few exceptions, it was disregarded by everyone – GSEs, Wall St. CEOs, bank regulators, members of Congress.



Source: R. Shiller, Irrational Exuberance 13 (2d. ed. 2005)

Slide 8

To my mind, lack of power and authority to regulate has not been the heart of the problem—lack of foresight and judgment about the unexpected is. Regulators, even a SRR, are no more endowed with superior foresight on taking office than others. And that is not intended as a criticism of individuals. The state of economic theory and knowledge about the occurrence of systemic risk does not match the lofty goal of saying we are going to prevent it from happening.

Twenty years ago, to deal with the US S&L collapse, the Administration put through legislation to pay the bill (a mere $150 billion) and of course provide new regulation. The then Treasury Secretary testified that "Two watchwords guided

us as we prepared a plan to solve the problem—NEVER AGAIN". And naturally politicians are saying the same thing again today, while repeating some of the same errors in their control of the FHA and its exploding volume of government guarantees for mortgage loans. (Its capital is now down to 0.53%, which would be terminally undercapitalized for a private bank.)

I would suggest that we not count entirely on preventing major financial failures from happening again, in a manner no one now foresees. A good part of our thinking and efforts should be directed toward better methods of resolving such failures when they do occur. The whole exercise is how to allocate the losses, not to taxpayers but to private participants in the failed firm, in a way consistent with maintaining incentives for market discipline while minimizing to the extent possible spillover costs. That is the topic, and the reason, for this workshop today.

OPINION

Why Toxic Assets Are So Hard to Clean Up

By Kenneth E. Scott
And John B. Taylor

Despite trillions of dollars of new government programs, one of the original causes of the financial crisis—the toxic assets on bank balance sheets—still persists and remains a serious impediment to economic recovery. Why are these toxic assets so difficult to deal with? We believe their sheer complexity is the core problem and that only increased transparency will unleash the market mechanisms needed to clean them up.

The bulk of toxic assets are based on residential mortgage-backed securities (RMBS), in which thousands of mortgages were gathered into mortgage pools. The returns on these

> Securitization was maddeningly complex. Mandated transparency is the only solution.

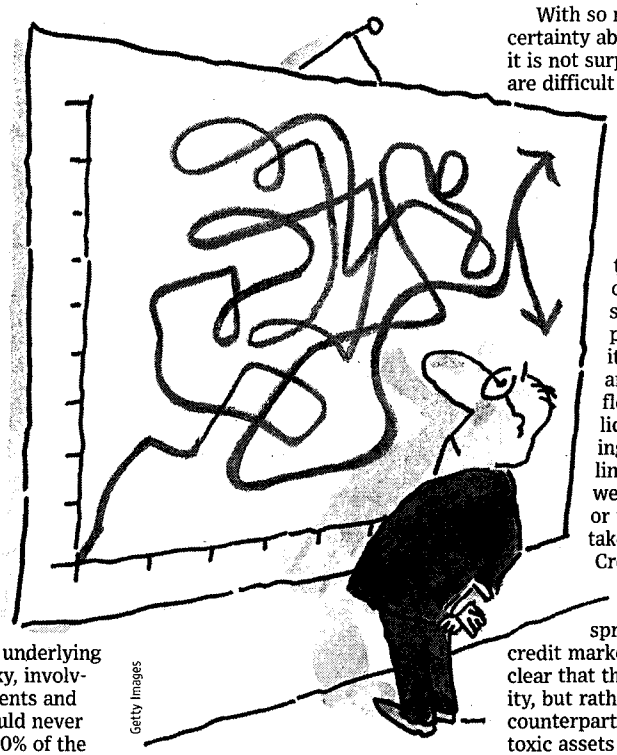
pools were then sliced into a hierarchy of "tranches" that were sold to investors as separate classes of securities. The most senior tranches, rated AAA, received the lowest returns, and then they went down the line to lower ratings and finally to the unrated "equity" tranches at the bottom.

But the process didn't stop there. Some of the tranches from one mortgage pool were combined with tranches from other mortgage pools, resulting in Collateralized Mortgage Obligations (CMO). Other tranches were combined with tranches from completely different types of pools, based on commercial mortgages, auto loans, student loans, credit card receivables, small business loans, and even corporate loans that had been combined into Collateralized Loan Obligations (CLO). The result was a highly heterogeneous mixture of debt securities called Collateralized Debt Obligations (CDO). The tranches of the CDOs could then be combined with other CDOs, resulting in CDO^2.

Each time these tranches were mixed together with other tranches in a new pool, the securities became more complex. Assume a hypothetical CDO^2 held 100 CLOs, each holding 250 corporate loans—then we would need information on 25,000 underlying loans to determine the value of the security. But assume the CDO^2 held 100 CDOs each holding 100 RMBS comprising a mere 2,000 mortgages—the number now rises to 20 million!

Complexity is not the only problem. Many of the underlying mortgages were highly risky, involving little or no down payments and initial rates so low they could never amortize the loan. About 80% of the $2.5 trillion subprime mortgages made since 2000 went into securitization pools. When the housing bubble burst and house prices started declining, borrowers began to default, the lower tranches were hit with losses, and higher tranches became more risky and declined in value.

To better understand the magnitude of the problem and to find solutions, we examined the details of several CDOs using data obtained from SecondMarket, a firm specializing in illiquid assets. One example is a $1 billion CDO^2 created by a large bank in 2005. It had 173 investments in tranches issued by other pools: 130 CDOs, and also 43 CLOs each composed of hundreds of corporate loans. It issued $975 million of four AAA tranches, and three subordinate tranches of $55 million. The AAA



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tranches were bought by banks and the subordinate tranches mostly by hedge funds.

Two of the 173 investments held by this CDO^2 were in tranches from another billion-dollar CDO—created by another bank earlier in 2005—which was composed mainly of 155 MBS tranches and 40 CDOs. Two of these 155 MBS tranches were from a $1 billion RMBS pool created in 2004 by a large investment bank, composed of almost 7,000 mortgage loans (90% subprime). That RMBS issued $865 million of AAA notes, about half of which were purchased by Fannie Mae and Freddie Mac and the rest by a variety of banks, insurance companies, pension funds and money managers. About 1,800 of the 7,000 mortgages still remain in the pool, with a current delinquency rate of about 20%.

With so much complexity, and uncertainty about future performance, it is not surprising that the securities are difficult to price and that trading dried up. Without market prices, valuation on the books of banks is suspect and counterparties are reluctant to deal with each other.

The policy response to this problem has been circuitous. The Federal Reserve originally saw the problem as a lack of liquidity in the banking system, and beginning in late 2007 flooded the market with liquidity through new lending facilities. It had very limited success, as banks were still disinclined to buy or trade such securities or take them as collateral. Credit spreads remained higher than normal. In September 2008 credit spreads skyrocketed and credit markets froze. By then it was clear that the problem was not liquidity, but rather the insolvency risks of counterparties with large holdings of toxic assets on their books.

The federal government then decided to buy the toxic assets. The Troubled Asset Relief Program (TARP) was enacted in October 2008 with $700 billion in funding. But that was not how the TARP funds were used. The Treasury concluded that the valuation problem seemed insurmountable, so it attacked the risk issue by bolstering bank capital, buying preferred stock.

But those toxic assets are still there. The latest disposal scheme is the Public-Private Investment Program (PPIP). The concept is that private asset managers would create investment funds of half private and half Treasury (TARP) capital, which would bid on packages of toxic assets that banks offered for sale. The responsibility for valuation is thus shifted to the private sector. But the pricing difficulty remains and this program too may amount to little.

The fundamental problem has remained untouched: insufficient information to permit estimated prices that both buyers and sellers find credible. Why is the information so hard to obtain? While the original MBS pools were often Securities and Exchange Commission (SEC) registered public offerings with considerable detail, CDOs were sold in private placements with confidentiality agreements. Moreover, the nature of the securitization process has made it extremely difficult to determine and follow losses and increasing risk from one tranche and pool to another, and to reach the information about the original borrowers that is needed to estimate future cash flows and price.

This account makes it clear why transparency is so important. To deal with the problem, issuers of asset-backed securities should provide extensive detail in a uniform format about the composition of the original pools and their subsequent structure and performance, whether they were sold as SEC-registered offerings or private placements. By creating a centralized database with this information, the pricing process for the toxic assets becomes possible. Making such a database a reality will restart private securitization markets and will do more for the recovery of the economy than yet another redesign of administrative agency structures. If issuers are not forthcoming, then they should be required to file the information publicly with the SEC.

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