

The Global Credit Crisis, and Policy Response¹

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This thing has a lot of moving parts. It is easy to miss the underlying structural forces that are making it all go. The goal of this paper is to provide an overarching story of the crisis within which all the smaller stories can find their proper place.

Everyone is looking for such a story; indeed there are multiple stories competing for attention at the moment. Some see a morality tale—the crisis is just Madoff writ large, Ponzi finance at a global scale. Others see distributional class conflict, either intracapitalist between Wall Street and Main Street or, more traditionally, a conflict between capitalist profits (bonuses) and worker wages (pensions). Some see a political story of regulatory capture that goes all the way to the top—Summers and his hedge fund consultancy. Others see a Polanyi-esque empirical reckoning of alternative economic models, market versus state, deregulation versus social control. Perhaps it is a story of intellectual hubris, of black-box financial engineering running wild over native common sense. Or maybe it is a story of childish emotional instability (not to say clinical illness) swinging between euphoria and depression; the financial system needs some adult supervision at the very least, or maybe time in a locked ward under 24-hour watch.

Every one of these stories has its satisfactions, and in that sense has some element of truth; I have some sympathy for all of them. For my own taste, however, none of them sufficiently engages with the facts on the ground, with the actual institutional detail behind the scenes. In what follows, I propose an alternative overarching narrative that arises directly from what I take to be the salient facts. It is, I suppose, a Minskian narrative at heart, but very much updated to take account of the revolution in finance—a revolution both institutional and intellectual—that has taken place over the last thirty years.²

For me, the crisis is clearly a test of the brave new world of modern finance, specifically the apparatus supporting securitization. It was the collapse of that apparatus that brought us the crisis, and it is the improvisation of substitutes for that apparatus (mainly by the Fed) that has put a floor underneath the collapse. Our task is to identify where the system has failed, and to put in place fundamental institutional change to ensure that it will not fail in this way again.

Over the last thirty years, we have been moving from a bank credit system to a capital markets credit system, but our regulatory apparatus has not kept up. As we made this

¹ Remarks prepared for IRE and EPS Workshop, “The Financial and Banking Crisis: Looking for Solutions”, June 15-16, 2009, Paris.

² For my view on Minsky see Mehrling (1999). On the revolution in finance, see Mehrling (2005).

historic shift, some argued that the new capital markets credit system would not need any regulatory apparatus, but such arguments are harder to credit today. Today we see more clearly that the new system was not so much an independent alternative to the existing system as it was symbiotic with it, intertwined at multiple levels including the level of regulatory support through the Fed and the FDIC.

Under the old “legacy” banking system, banks made loans and funded those loans with deposit liabilities. The liquidity risk involved in this operation was handled by a system of interbank lending (Fed Funds market), subject to ultimate government backstop through the discount window. The solvency risk was handled by a system of capital buffers (Basel Accord), subject to ultimate government backstop through deposit insurance (FDIC).

In the new “shadow banking” system, by contrast, loans were transformed into securities, and investors in those securities funded their positions in the wholesale money market using asset-backed commercial paper, repurchase agreements, or simply unsecured short term borrowing (Eurodollars). Liquidity risk was handled by designing the securities so that they would be eligible collateral for such money market borrowing, but the ultimate liquidity backstop proved to be lines of credit with the legacy banking system. Solvency risk was handled by credit enhancement using interest rate swaps and credit default swaps, so the ultimate solvency backstop was the capital buffer on the balance sheet of swap counterparties.

The new system grew up in multiple versions, but all of them had the same essential features; the differences were driven more by regulation than by economics. So in some cases the shadow banking system arose off-balance sheet of the legacy banking system (think Citibank and its SIVs funded with ABCP), while in other cases the shadow banking system arose on-balance sheet of the legacy banking system (think UBS and its supersenior positions funded with RP). Investment banks such as Bear Stearns, Lehman Brothers, and Merrill Lynch played a role as swap counterparties, but they had their own ultimate swap counterparties in the monolines (Ambac, MBIA) and AIG. The IMF Global Financial Stability report includes the following illuminating table:

Table 2.3. Market Participants in Credit Derivatives, 2004 and 2006

(In percent of total)

	Protection Buyers		Protection Sellers	
	2004	2006	2004	2006
Banks	67	59	54	43
Hedge funds	16	28	15	31
Pension funds	3	2	4	4
Insurance	7	6	20	17
Corporations	3	2	2	1
Mutual funds	3	2	4	3
Other	1	1	1	1

Source: British Bankers' Association (2006).

The credit crisis that began in August 2007 involved failure of both the liquidity and the solvency risk systems, and the consequence has been a freezeup in new capital market credit, as well as a freezeup in secondary markets for so-called legacy credits. Policy response has however so far been focused largely on the consequences of the crisis for the legacy banking system. In effect, we have gone to war with the regulatory apparatus we have, not with the apparatus that we might wish to have. But winning the war will require us to understand that our goal cannot be limited to rescue of the legacy banking system; indeed it will require us to imagine the credit system of the future, and to use the crisis as an opportunity to put the foundations of that new system in place today.

Brave New World

The key idea of the brave new world was to separate credit funding from credit risk (also interest rate risk, but the key issue for the current crisis is credit risk). Every credit can be viewed as a Treasury bill with various risk exposures added; the idea was to carve out the Treasury bill piece so it could be funded and traded separately. Just so, the CDO structure was designed to create as much AAA debt as possible. The securities weren't T-bills, but they were as close as you could get without the government actually guaranteeing the payments.

Why ever would you want to do this? There were and are arguments on efficiency grounds—credit risk was mispriced under the older system--but in retrospect the main driver was demand. The world demand for dollar denominated fixed income assets outstripped supply, and the system responded by generating new sources of supply. Three sources of demand can be identified.

First, there was the global trade imbalance, the financial side of which involved China accumulating trillions of dollar-denominated fixed income assets, mostly Treasuries and GSE bonds. Include in this factor also the sovereign wealth funds, which accumulated dollar reserves so as to avoid crises caused by short term money outflows.

Second, there was the demographic push from pension funds and insurance companies looking to fund retirement obligations for retiring baby boomers. Annuities, whether explicit or implicit (as in DB pension structures), require fixed income assets to match liabilities, and many companies were building asset capacity in advance of anticipated demand.

Third, there was the globalization of finance, especially in Europe. Portfolio managers were looking to diversify out of domestic exposure, and the first natural step was to enlarge U.S. holdings.

The first of these sources of demand focused mainly on Treasuries and GSE bonds, and the consequence was to drive down the yield on these securities and also to absorb much of the supply. As a consequence the second and third source of demand had to consider alternative sources. This demand provided strong incentive for supply-side innovation. The innovation we got largely involved mobilizing U.S. household debt, especially mortgage debt, as a portfolio substitute for more traditional government and corporate debt.

How do we know that? Historically, non-financial debt has been issued by the government, business, and households, and the order of magnitude from each of these issuers has been about the same. The share of business debt reached its post-war peak of 38.1% in 1981; the share of government debt reached its post-war peak of 36.2% in 1993; and the share of household debt reached its post-war peak of 44.3% in 2006. Even as the lead in the debt sweepstakes changed over time, the total debt relative to GDP continued to climb, from 1.39 in 1981, to 1.86 in 1993, and 2.21 in 2006. As a matter of arithmetic, then, it is clear that expansion of household debt was the most important source of the recent debt expansion, and hence the most important source of supply that met the burgeoning demand.

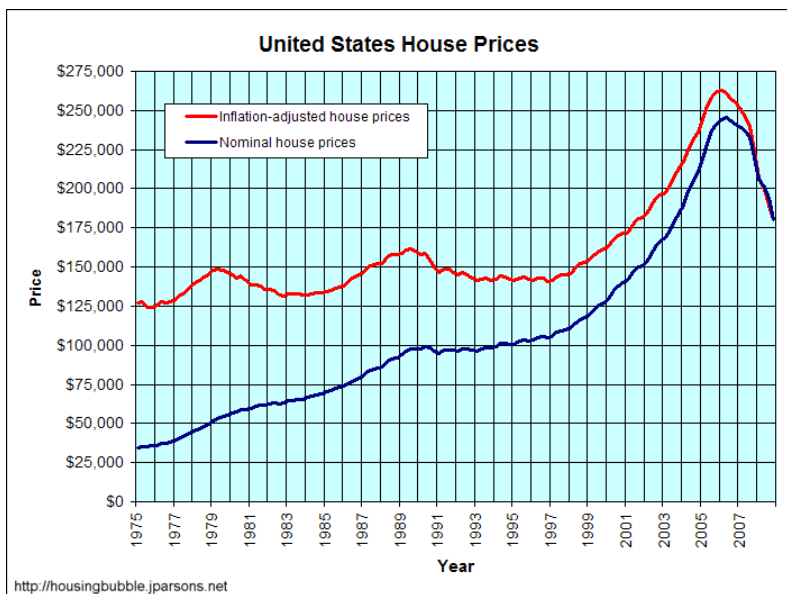
The mobilization of household debt was made possible by the confluence of two distinct elements.

First, U.S. housing policy, with its tremendous support for mortgage issuance (mortgage interest tax deduction), and specifically mortgage securitization. Ginnie Mae issued the first mortgage-backed security in 1970; Fannie Mae and Freddie Mac got into the act in 1981 and 1983 respectively. The original purpose of these financial innovations was to make mortgages into a more attractive investment, both for the banks that originated them (S&Ls in particular) and for other potential investors. The GSE itself typically provided credit enhancement (for a fee) in the form of payment guarantee. Tranching of the securities was used to handle the problem of prepayment risk, as well as interest rate risk.

The second, and in retrospect critical, supply-side element was financial engineering that extended mortgage securitization from so-called conforming mortgages to non-conforming mortgages, including jumbos and subprime. The main problem was to find a

substitute for the credit enhancement provided by the GSEs. The solution was found in adaptation of some financial engineering originally developed for handling the credit risk involved in business loans (see next section for details).

The consequence of all of these factors, demand and supply, was that for about a decade the U.S. economy was able to generate the dollar assets that the world financial system demanded. The cost was an unprecedented leveraging up of household balance sheets, as well as the entire U.S. economy. A further cost, as we are now coming to recognize, was a distortion of residential real estate prices that spread across much of the U.S. economy, i.e. the housing bubble. On the way up that distortion served as a third supply-side element, providing apparent security for the unprecedented leverage.



Credit Risk Transfer

It is important, for the argument that follows, to understand where the financial engineering came from and how it was supposed to work.

Suppose that a bank has a pool of business loans, which it is happy to hold, but it is concerned about capping its exposure to default risk on those loans. In an efficient market, the value of the risky loan portfolio should be equal to the value of a similarly sized riskfree loan portfolio plus the value of an insurance contract that guarantees the risky loan portfolio. If the bank buys the insurance, then its net position becomes completely riskfree. This insurance is a credit default swap (CDS).

On the other side of the swap contract, the seller of insurance now owns a risky asset. If he combines that risky asset with just the right amount of riskfree debt, he can recreate exactly the risk exposure of the original pool of business loans. If he funds this position by issuing pass-through notes, then whoever buys the notes will have exactly the risk

exposure of the original pool of business loans. This combination of insurance plus riskfree debt is known as a “synthetic CDO” (Collateralized Debt Obligation), synthetic because the underlying risk asset (the insurance policy or CDS) is a credit derivative not an actual loan.

Bank		CDO	
Assets	Liabilities	Assets	Liabilities
Loans		Treasury bills	CDS
CDS			Notes

This is how the original credit default swaps and collateralized debt obligations came into existence (Tett 2009). Even in that very first deal however the notes issued by the CDO were divided into risk classes. The notes that took the first loss were rated Ba2, while the notes that took the second loss were rated AAA (p. 55). Significantly, two-thirds were rated AAA.³ This first deal happened in December 1997.

Subsequently, it seemed a simple matter (conceptually anyway) to move this technology over into the mortgage space in order to handle the problem of default risk. In most of these cases however the deal was structured as a “cash” CDO rather than a synthetic CDO, in the sense that the assets backing the securities issued by the CDO were actual loans, not derivatives. (Synthetic CDOs only arose when the underlying mortgage “raw material” proved insufficient to satisfy demand for the CDO securities.) Further, typically the underlying loans were not the original mortgages but rather mortgage backed securities, hence CDO of ABS.⁴

Despite these differences, the underlying idea remained the same. The credit risk in the underlying mortgages passed through to the securities issued by the CDO, and by design most of that risk was concentrated in the lower rated securities. Even when the underlying mortgages were subprime, two-thirds of the securities issued by the CDO could earn a rating of senior AAA. The Bank for International Settlements report on Credit Risk Transfer includes the following illuminating table:

³ In this first deal, as recounted by Tett, the risky loan portfolio was \$10 billion, and the insurance premium was \$700 million. Only \$700 million in notes were issued, and that \$700 million was invested in Treasury bills. Thus the return on the notes did not exactly replicate the return on the risky loan portfolio. The note-holders’ potential loss was only \$700 million, not the entire \$10 billion, and the residual (so-called “super senior”) risk was retained by the issuing bank (J.P. Morgan). Ultimately J.P. Morgan bought insurance from AIG to cover that residual risk, and the original price of that insurance was only 2 basis points.

⁴ One reason for that seems to have been that the data on default experience, such as it was, referred to risk classes not to individual issuers. Historical data of course proved a poor forecast of true default probabilities in a world where the credit innovation itself enabled much greater credit extension than in the past.

Table C.1
Capital Structure for Typical 2006-vintage ABS CDOs
 Percent of notional

CDO Tranche Rating	High-grade ABS CDO	Mezzanine ABS CDO
Sr. AAA	11 - 100	34 - 100
Jr. AAA	6 - 11	20 - 34
AA	3 - 6	12 - 20
A	2 - 3	9 - 12
BBB	1 - 2	4 - 9
Unrated	0 - 1	0 - 4

Source: *Rating Actions: Something Had to Give*, Morgan Stanley CDO Market Insights, 16 July 2007

In this way, loans to households were transformed into securities that could substitute for Treasury and government bonds. They never traded in liquid markets like Treasuries, but they paid a compensating higher yield.

Shadow Banking and Liquidity Risk

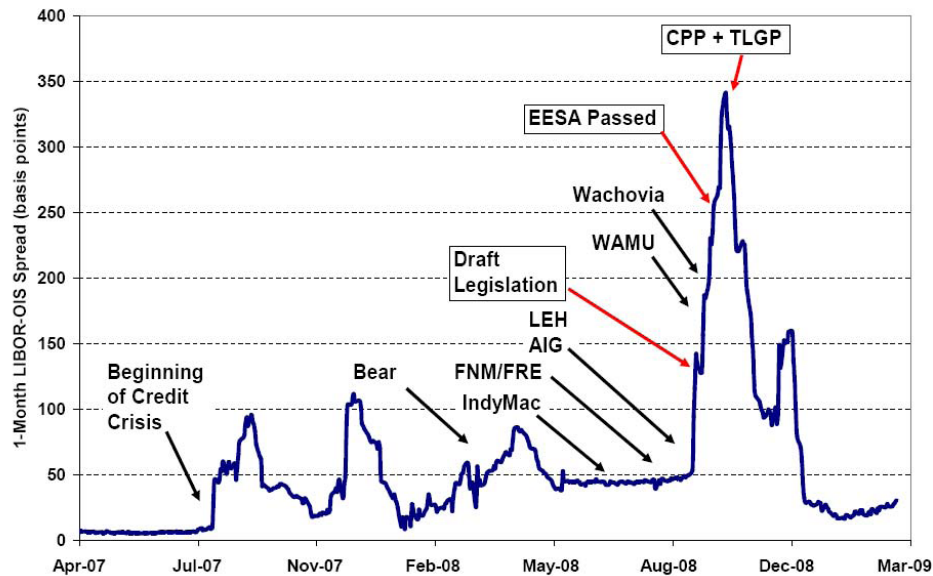
The new securities themselves may not have been liquid, but the purported high credit quality of the top tranches made them quite suitable as collateral in the wholesale money market. Indeed, the yield on the new securities meant that money market borrowing could apparently be used to finance holding of the securities, with a small profit left over after financing costs.

Because of this, the top tranches tended to be held by highly leveraged institutions, which used the assets to get cheap secured financing in the ABCP or RP market. This financing, in turn, was provided largely by the money market mutual funds which used the resulting money market assets to provide an attractive yield on the shares they issued as substitutes for bank deposits. This kind of thing became known as the shadow banking system. In retrospect, it seems clear that the profitability of this arrangement was (at least in part) a return for bearing liquidity risk. If ever there were a problem rolling over funding, these leveraged strategies would be at risk, as would those who funded them.

Some of the parties engaged in this strategy (or their regulators) understood the potential problem, and made precautionary arrangements. Because of concern about funding rollover, corporate commercial paper is typically issued with a backup line of bank credit, and it was natural to extend these familiar arrangements to cover ABCP as well. In the event, of course, the liquidity promised in these backup lines depended on the banking system's own access to credit in the Eurodollar market, and ultimately its own backup line of credit with the Fed, i.e. the discount window.

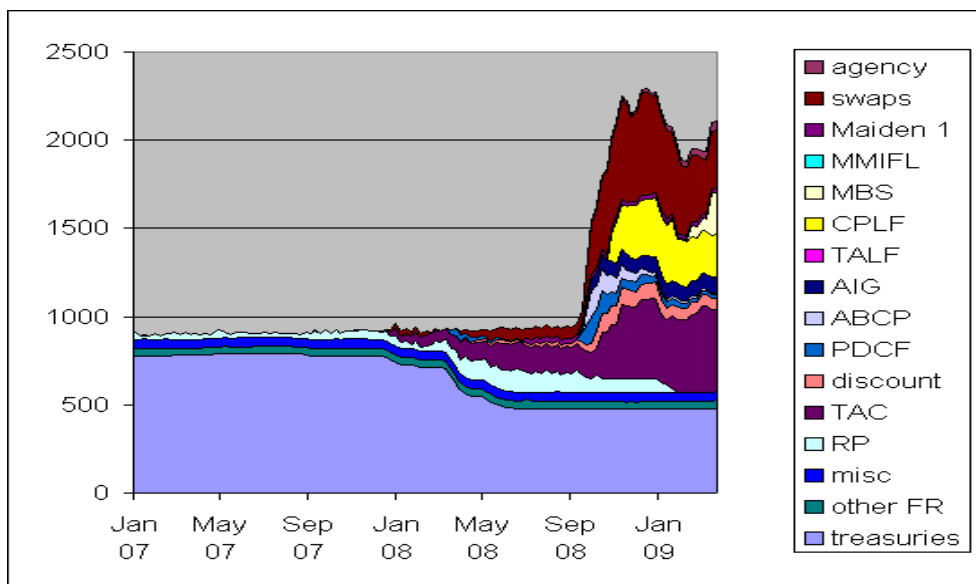
This kind of arrangement explains why the crisis took the form it did. When MMMFs stopped buying ABCP, issuers turned to the banks which turned to the Eurodollar market, so driving LIBOR up relative to the Fed Funds rate. Later on, when the general collateral RP market also came under similar pressure, this disruption similarly showed up in the

LIBOR spread. Finally, in the aftermath of the Lehman bankruptcy, which froze the unsecured financial CP market, LIBOR spreads moved to their highest level ever. The following chart is taken from Swagel (2009).



The Fed responded to spikes in LIBOR by activating its own backstop, mainly the Term Auction Facility (a kind of anonymous discount window) which ultimately accepted any investment grade asset as collateral. The Fed also created new backstop facilities for some nonbank dealers, and lent Treasuries against investment grade collateral, which Treasuries could then be used as RP collateral. But all of this really amounted to the same thing, namely liquidity backstop for the banking system.

In the first phase of the crisis, the Fed sterilized the effect of its lending on the money supply by selling Treasury bills, in effect replacing loans to the government with loans to banks. After Lehman however that was not enough and the Fed funded its expanded lending by expanding its liabilities at the same time. Here is the asset side of the Fed's balance sheet, lifted from the Econbrowser blog.



This expansion of the Fed's balance sheet has been widely misunderstood within the economics profession, because it has been viewed through the lens of a pre-existing debate about the monetary transmission mechanism. Those who emphasized the importance of the money supply (on nominal spending) saw the expansion as quantitative easing, and warned about eventual inflationary consequences. Those who emphasized the credit channel (as Bernanke) saw the expansion as providing credit that was temporarily unavailable in the private market. The fact that the balance sheet expanded on both sides, and in both cases with the private sector as counterparty, tells us that something else was going on.

I would argue that the Fed's actions after Lehman should be understood as moving the wholesale money market onto its own balance sheet. Banks with surplus funds lent them to the Fed by holding excess reserve balances, and banks that needed funds borrowed them from the Fed through the discount window. Foreign banks that needed dollar funding got it through their own central bank, which got it from the Fed through the liquidity swap facility. Banks that were short of collateral eligible for discount borrowed directly through the new commercial paper facility. Shadow banks that could not deposit in the Fed instead bought Treasury bills, and the Treasury deposited the proceeds at the Fed.

Once we think about the Fed's balance sheet expansion in this way, the doubling seems in fact rather small. After all, the wholesale money market is much larger than the mere trillion or so that Fed took on. Deleveraging provides one answer why the expansion was not even larger. But the deeper answer, I think, comes from an appreciation that the Fed was acting as lender of last resort, and in doing so supporting continued lending in the private money market that would otherwise have frozen. In effect the Fed was offering a standing facility at prices away from market prices, so only those who most needed it took advantage. Simply knowing it was there made others willing to deal privately at more reasonable prices.

Thus, the commercial paper lending facility expanded and then contracted as private lending recovered. The central bank liquidity facility has followed a similar course. The important thing to realize is that, as these temporary liquidity facilities have wound down, the Fed has ramped up additional facilities, now aimed at restarting the securitized lending system more generally.

In the mortgage space, a first step has been to restore the market in the raw material, which is to say the mortgage backed securities themselves. Toward that end the Fed has purchased large quantities of the securities (to date only GSE issues), but also made commitments to buy and sell in the future. (Table 3 of H.4.1 for May 20 shows commitments to buy of 149 billion, and commitments to sell of 106 billion.) In effect, as dealers have pulled away from market-making in this space, the Fed has stepped in to take their place. Before the crisis, the dealers held inventory of MBS financed with RP borrowing. Today the Fed holds inventory of MBS financed with its own deposit liabilities.

The purpose of the TALF (Term Asset Backed Lending Facility) is apparently to go the next step, to support new securitizations. Takeup of this facility has not been large to date, and has been limited to non-mortgage consumer assets, but the Fed has expressed clear willingness to expand as needed to meet demand. Before the crisis, the shadow banking system was funding AAA securitizations with MMMF share deposits. Today the Fed is funding AAA securitizations with its own deposit liabilities.

Here are the relevant balance sheet entries as of May 20, 2009:

Fed Balance Sheet, Major New Items Only

Assets	Liabilities
429 Term Auction Credit	200 Treasury Supplementary Account
235 Central Bank Liquidity Swap	951 Reserve Balances
157 Commercial Paper Funding Facility	
431 Mortgage Backed Securities	
16 Term Asset Backed Lending Facility	

Shadow Banking and Solvency Risk

The new securities were never intended to be traded, but they were intended to be priced, indeed to be marked to market. For the top tranches, the pricing was not supposed to be much of a problem, just a more or less tight spread over Treasuries of the same maturity. But for the lower tranches, where defaults would be absorbed, the price was expected to change depending on performance and expectations. Behind the scenes there was always a pricing model, and you could plug in performance and expectations to get a price, but it was just a model, not a market price, and FASB 157 definitely prefers market prices.

In practice, the traded part of this market was not the underlying credit but rather the credit derivative, specifically the credit default swap. Once the CDO structure had been established, with a series of notes rated by their supposed riskiness, it became possible to write a credit default swap on a particular tranche of a particular CDO. If a particular CDO had five riskiness tranches, then there could be five different CDSs, each referencing a particular security tranche. Here again, in an efficient market, you would expect the value of the risky security to be equal to the value of a similar riskless security plus the value of insurance on the risky security. One implication of this was that you could always convert your holding of a risky tranche into a riskfree security merely for the price of the insurance. Another implication was that, if you knew the price of the CDS, you also knew the price of the risky security.

The result was that, for the purposes of mark-to-market, prices came not from trading the underlying but rather from trading CDS on the underlying. If there were no trades in the particular swap you were interested in, there might be trades in swaps with a similar risk rating that you could use for reference. Most important of all, there was always liquidity in the index swap market, where you could trade an equally weighted index of twenty different swaps, each with the same initial risk rating. In practice, thus, the price of a particular CDO tranche was inferred from the price of the index swap contract with the same risk rating. The market to which prices were marked was the index swap market.

But what does it mean to say there was always liquidity in the index swap market? All it means is that you could readily find a counterparty willing to do a trade at a price near to the last quoted price. (It does not mean that that price was necessarily reasonable or correct.) When the system was working, that counterparty was typically an investment bank (like Bear or Lehman) acting as a swap dealer, taking the opposite side of your trade for a fee. They were willing to do this in part because they were committed to supporting the CDO market more generally. But they were not crazy. Ultimately they were market makers, willing to buy or sell the index at a price, but quite careful about their own net exposure.

This meant that sustained pressure on one side of the market would be met by falling prices, and that is exactly what happened in the early stages of the crisis. The freefall happened when the failure of Lehman and AIG took a key market maker, and the key ultimate seller of insurance, out of the system. Had someone else, perhaps the government, stepped in to do what Lehman and AIG had been doing, even at a high price, the freefall could likely have been stopped in its tracks. (This is what I proposed, in a letter to the Financial Times published Sept 23. See appendix and Mehrling 2009.) But there was no will, and no authority, to do so.

From this point of view, the key to understanding the solvency problem is to understand the source of the selling pressure in the CDS market. More people wanted to buy insurance than wanted to sell it, and the price of insurance therefore rose sky high; the implied price of the insured assets therefore plummeted. Why did this happen?

In some cases, certainly, prices changed as information came out about the true quality of the underlying mortgages. Faulty underwriting and outright fraud were important dimensions of this credit-fueled bubble, as of all previous bubbles. Prices of credit securities also changed as information came out about falling prices of the underlying real housing assets. This too is a familiar feature from previous bubbles. But there was also an additional dynamic, new to this particular situation and deriving from the underlying financial engineering.

Remember how the engineering was supposed to work. The default risk was supposed to be loaded on the lower CDO tranches, and that loading was supposed to buffer the upper CDO tranches. In a high-grade CDO, for example, the underlying portfolio would have to take a 10% loss before the 90% of Senior AAA securities would be affected by any default whatsoever. Since defaults always involve some recovery, the default rate would have to be at least 20% or even 30%. Rates like that are now being observed on subprime mortgages, but not on prime mortgages. Many such senior AAA securities have experienced no default to date, and yet their prices are still deeply impaired. What accounts for that?

What accounts for that is that the prices on these relatively sound securities were and are being read from the price on the AAA tranche of the ABX index. And that index was being driven by hedging activity of those holding cash positions in the lower tranches. To date the evidence of this is just anecdotal, so it is only possible to sketch a possible scenario to show a possible chain of causation.⁵ Circumstantial evidence however suggests that something like this was a key part of the crisis.

Consider the position of a U.S. pension fund manager, who in good faith invested funds in the AA tranche of a mezzanine CDO, choosing that tranche because it seemed to have good downside protection from the tranches below it, but also a more attractive yield than the more highly rated tranches above it. In the worst case, if the housing market were to turn bad, the manager was comforted by the underwriter's representation that he could always cap his losses by buying a CDS. So even if he bought 10 million, he felt he was in no danger at all of losing principal.

Then came the turn in the housing market, and the manager started getting nervous, but other managers were nervous too and the consequence was that the CDS on the AA was getting pretty expensive. So our manager once again tried to do the smart thing and bought instead the cheaper CDS on Junior AAA, trading principal exposure for basis risk exposure. The dealer that sold the CDS now had to find a hedge, and he also tried to do the smart thing, hedging in the senior AAA contract instead of the junior AAA. He knew about basis risk, however, and adjusted his hedge ratio accordingly; he bought more senior AAA insurance than he sold junior AAA insurance.

It is not hard to imagine that this kind of scenario was repeated, with variations, throughout the system. Just so, an underwriter who offered to stand behind his product by selling insurance at some point in the future would be wise to buy some insurance now

⁵ My thinking on these matters has been influenced by the account provided in Morris (2008).

as a hedge, and the AAA insurance is both cheap and generic. A hedge fund, buying the equity tranche with money borrowed from his prime broker, similarly would be wise to hedge from the start by buying insurance on an upper tranche to a multiple of his equity exposure.

Here is an idealization of how the system actually worked. (I have put all the basis risk on the balance sheet of the investment bank for simplicity. I have booked a purchase of credit protection as an asset, and a sale of credit protection as a liability.)

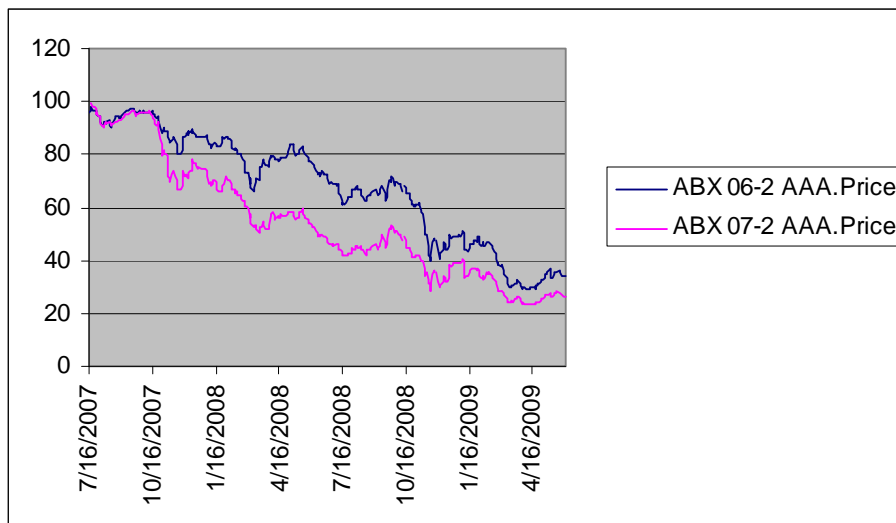
CDO		Investment Bank		Insurance	
Asset	Liability	A	L	A	L
MBS	High tranche Mid tranche Low tranche	High CDS Prime broker loan	Mid CDS Low CDS		High CDS Capital

Bank		Pension/Insurance		Hedge Fund	
Asset	Liability	A	L	A	L
High tranche High CDS	MM funding	Mid tranche Mid CDS	DB pension Annuity	Low tranche Low CDS	Prime broker loan

The question is, given all this demand for AAA insurance, why did the AAA insurance remain so cheap? (Actually, it didn't. The rising rate charged by AIG caused UBS to skimp on insurance coverage, relying instead on dynamic trading, a big no-no ever since portfolio insurance, as reported in the invaluable UBS Shareholders Report. But insurance remained too cheap for too long, so the question remains.) The answer is that the AAA insurance was being written by insurance companies, and the price they were charging was coming not from a market-making exercise that balanced buyers and sellers, but rather from a modeling exercise that compared the AAA tranche to a similar riskfree government security.

The result of all this credit risk transfer was that the capital buffer standing behind the CDO structure was not so much the capital of the hedge funds and pension funds that were holding cash positions in the lower tranches. Ultimately the capital that mattered was that of the insurance companies writing insurance on the upper tranches. But who were those insurance companies, and what kind of capital buffer did they have? Some were municipal bond insurers who, because of their important social function, were permitted to operate without very much of a capital buffer in order to reduce the cost of the insurance they offered. Others, like AIG, were private insurers who, because of their AAA rating, were not required to put up any capital on CDS exposure.

This kind of arrangement helps to explain why the crisis took the form it did. In the expansion phase of the system, market CDS prices were ultimately supported by the model CDS prices offered by the insurance sector. When this sector ran into trouble and stopped offering insurance, CDS prices moved to clear supply and demand. The way hedging worked in that market, that process led to a large increase in demand for AAA insurance, which led to skyrocketing insurance prices, implying plummeting prices on the underlying. Mark to market then spread the destruction throughout the system. Here is the history of the ABX, which shows how the periodic liquidity crises interacted with valuation of the top tranches.



Interaction of Solvency and Liquidity

Questions about the value of the underlying assets were of course at the heart of the liquidity problems faced by the shadow banking system. Once questions arise about valuation, haircuts on secured borrowing increase until ultimately credit dries up completely. The standard story here is that doubts about one class of assets, the CDOs backed by subprime, raised doubts about all such assets because no one knew where the subprime stuff was. Probably there was some of this going on among the less sophisticated players. But the deeper problem, as I have suggested, is that demand for AAA insurance undermined the mark-to-market pricing of even the relatively good stuff, and that somewhat phony solvency issue then undermined liquidity everywhere.

Causation went the other way too, since liquidity problems were also at the heart of the solvency problems faced by the shadow banking system. Ultimately liquidity in the AAA CDS contract was not achieved by deep pockets willing to absorb additional supply whenever the price moved a tiny bit away from fundamental value. There never were such deep pockets, although for a while the insurance companies tried to play that role. Ultimately liquidity in the AAA CDS contract was achieved by letting price find its level-fundamental value be damned. Liquidity problems in the CDS market thus contributed to solvency problems throughout the system.

The dynamic I am suggesting is that liquidity problems (in CDS) caused solvency problems which then caused further liquidity problems (in funding markets) which then caused additional solvency problems, and so on and so forth in a downward spiral. This **liquidity-solvency cumulative process** worked to inflate the bubble on the way up, and it is now working to deflate the bubble on the way down.

This way of thinking about the problem has implications for policy, both short term and long term. Short term, it means that there are probably quite a lot of relatively sound assets out there that are being undervalued by a mark-to-market exercise such as that used by the IMF to calculate likely losses. Of course there are also a lot of fundamentally unsound assets, both because of faulty underwriting and because of deterioration of the fundamentals. And of course the price of the underlying real assets has yet to return to fundamental value, so outstanding credits can be expected to continue to deteriorate. These are both big caveats, but if the liquidity-solvency cumulative process is real, then it stands to reason that sound assets have been taken down along with the unsound assets. Those holding the sound assets know what they have and are reluctant to sell at prevailing prices, but at the same time they are under pressure to mark their positions to market and that constrains them from doing any new lending. Hence the freeze.

The short run challenge is therefore to put a floor on this cumulative process, and to begin sorting out the sound from the unsound. The Fed has provided a floor on the liquidity spiral by its willingness to provide funding to keep assets in place. Presumably the PPIP is intended to sort the sound from the unsound, and to establish some market marks for the sound that will put a floor on the solvency spiral. Once we have market marks for the underlying assets, presumably the CDS marks will become irrelevant.

The long run challenge is to reconstruct the system in order to put more permanent bounds on the liquidity-solvency cumulative process, both on the upside and on the downside.

Shadow Banking and Regulation

It is worth recalling how the system was supposed to work, which involves recalling why the government did not prevent but rather encouraged the development of this system. The whole point of the 1988 Basel Accord, which introduced risk-weighted capital requirements (updated in 2004 as Basel II), was to regulate risk-taking by banks. On-balance sheet risk absorbed regulatory capital charges, but off-balance sheet risk did not. Eventually, as Glass-Steagall was relaxed, banks could originate any kind of business they wanted; capital controls only determined where that business was ultimately booked. The regulatory authorities apparently hoped that credit risk would be held by deep pockets elsewhere in the economy, namely pension and insurance companies.

The authorities knew of course that liquidity risk was being retained within the banking system, but that was as it should be. The banks were supposed to be charging the shadow banking system for that service.

The authorities also knew that exposure to the AAA tranches was being retained within the banking system, and that too was as it should be. The whole point was to get someone else to hold the lower tranches.

The deep pockets were supposed to be pension and insurance companies because they were presumed to be pools of unleveraged capital, as opposed to the banking system which was a highly leveraged operation on top of a thin slice of capital.

Looking back, the most serious miscalculation of regulation seems to have been the decision (if indeed there ever was an actual decision) to allow private insurers to write insurance on the AAA tranches. Not only did they write insurance that they would predictably be unable to deliver if, God forbid, the insured event ever happened. Even worse, they underpriced that insurance, so providing false price signals to everyone else at every tranche level in the system. (Also, they wrote insurance to people who had no insurable interest, but that is another story.) That is why, on the way up, credit spreads got so low.

The correction of this fundamental flaw is simple (conceptually anyway). The government needs to go into the AAA insurance business. It needs to do this in order to establish a more appropriate price, and hence a more appropriate price signal to everyone in the system. And it needs to do this in order to provide the kind of deep pocket backstop that can actually deliver on such insurance.

The model to have in mind here is the way the government went into the liquidity business more than a century ago, a decision that eventually led to today's monetary policy. Today central banks set the short term money rate of interest, and they do so without doing very much money market lending (present balance sheets notwithstanding!) They do so by establishing standing facilities away from the market rate, and these backstops provide the supports within which private market participants generate private liquidity (see Mehrling 2008).

This modern mechanism has evolved over more than a century. Initially the central bank simply provided a discount facility (Bank Rate) that it did not change. In times of crisis, market rates rose until Bank Rate looked reasonable and then the private money market would move onto the balance sheet of the Bank of England. Perhaps this is the better analogue to start with as government goes into the AAA insurance business.

The analogue suggests that the government should start by offering expensive insurance at a price that does not change. In times of crisis, people will buy that insurance, while in ordinary times they will not. As with the discount window, it may be useful to establish some guidelines before the crisis concerning what assets will be eligible for AAA insurance, and that "seal of approval" will have some market value even if the insurance is not purchased. A key issue will be integrating this public AAA insurance backstop with the private CDS market as it is now emerging, specifically with the clearinghouse/exchange that will be at the center of that market.

Currently the TALF is charging 100 basis points over LIBOR to provide 90% non-recourse financing for new securitizations; it remains to be seen what it will charge for legacy securitizations, but certainly no less than that. The important point is to realize that this is a kind of backhanded expensive insurance. Is that the right price? We cannot know. We do know that it is much higher than AIG was charging for 100% insurance, and perhaps that is the most important thing. (AIG was charging UBS 15 bp.)

Finally, supposing that we do fix securitization by introducing Insurance Rate as a policy instrument in addition to Bank Rate, there will be much work to be done to integrate these two policy tools. For example, it has been proposed by numerous authors that a prime source of the credit boom was excessively easy monetary policy, meaning too low Bank Rate (Taylor 2009). Whatever the merits of this case, I have been proposing alternatively that the source of the problem was excessively easy insurance policy, meaning too low Insurance Rate.

Integrating insurance policy with monetary policy, both conceptually and practically, will involve thinking about monetary policy in a different way. The channel system, which involves standing facilities on both sides of the target money rate, has been developed in order to manage our dual system of public and private liquidity provision, but the emphasis has remained on getting the rate target right, which is to say setting Bank Rate equal to the “natural rate”. To my mind, one consequence of that framework has been systematic underpricing of liquidity risk, so that incentives to take liquidity risk have been distorted.

One reason for this mispricing of liquidity, in retrospect, is that we have been trying to hit multiple targets with a single instrument. Adding a second instrument will help to clarify matters, both conceptually and practically.

Conclusion

I have been suggesting that, if securitization is the problem, then insurance is the answer. The financial system did insurance wrong during the runup, and as a consequence we got an unsustainable boom and a nearly unstoppable freefall when the bubble burst. But if we do insurance right, we can make securitization work. Doing insurance right will involve the government going into the insurance business.

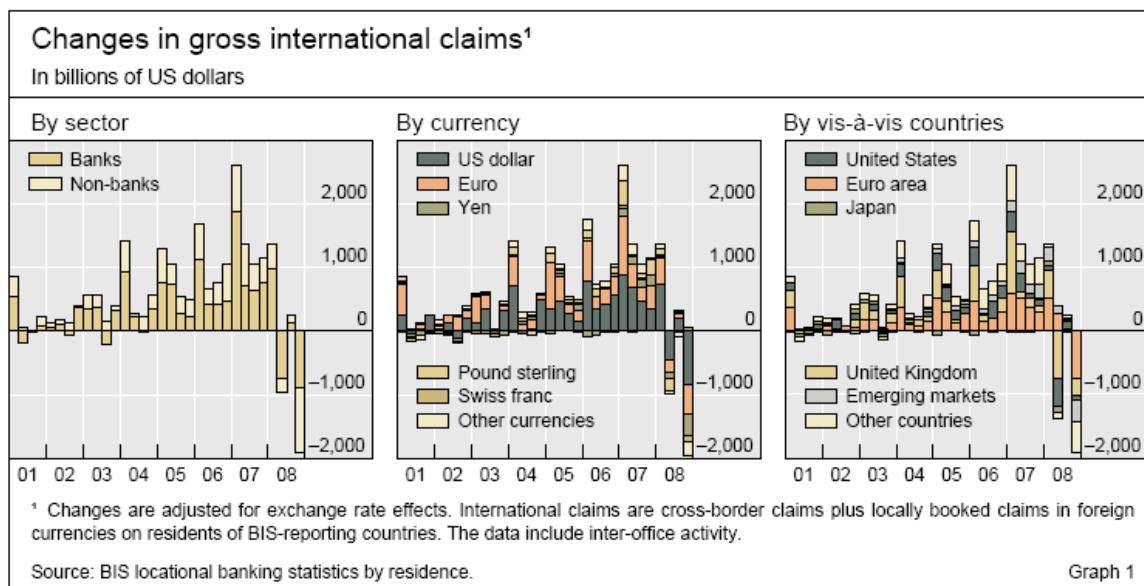
From a larger perspective, securitization is not the problem but rather the answer to a deeper set of problems. I have argued that the demand for dollar fixed income assets was the underlying source of the pressure to innovate, and the pressure to ramp up the innovation before all the kinks had been worked out. Supposing we get the kinks worked out, the underlying problems that securitization was solving will once again come to the forefront.

Simply put, the American consumer seems to be about as leveraged as she/he can possibly be, indeed excessively so. Government is moving strongly to replace the consumer, not only as a source of final demand, but also as a source of dollar fixed

income assets. The share of government debt is well on course to surpass its previous post war peak within the next few years. But that may not be sustainable either.

Supposing we solve the securitization problem, therefore, we still need to solve the deeper problems that were driving the demand for dollar fixed income assets. Maybe that means reform of the international monetary system, so that the reserve currency status of the dollar does not automatically produce demand for dollar assets. Maybe that means reform of the American retirement system, so as to require less fixed income assets. Maybe that means reform of the system of financial globalization so that diversification involves swapping exposures between national systems, each with its own home bias, rather than additional debt expansion. Probably we will need to do something on all three fronts.

In closing, it is worth reflecting on the likely outcome should we fail to address these three underlying problems effectively. These three have been the drivers of the credit bubble, but they have also been the drivers of economic activity more generally, and all across the globe. Already the trend toward financial globalization seems to be shifting in reverse, though whether that is temporary or permanent remains to be seen. The most recent BIS Quarterly Review (June 2009) includes the following illuminating chart.



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Appendix

Put a floor under the ABX securities index

Published: September 23 2008 03:00 | Last updated: September 23 2008 03:00

From Prof Perry Mehrling.

Sir, It is of course good news that the Treasury and Fed are looking for a "comprehensive approach to address the illiquid assets on bank balance sheets" ("Stocks soar on rescue hopes", September 18). The devil, however, is in the details.

Let us recall that many of the assets in question were priced, at the time of initial sale, by reference to the index swap prices on the various tranches of the ABX index of subprime mortgage-backed securities. So long as dealers were willing and able to make a two-way market in those contracts, the liquidity in the ABX was transferred to liquidity in related contracts.

Today, however, everyone wants to buy insurance and no one wants to sell, and dealers are in no position to take the imbalance on to their own balance sheets. The consequence is falling index prices, which are transferred to all assets that are priced by reference to those prices.

The way to stop the free fall is to put a floor under the index, not to buy its components outright.

The Treasury can do this by stepping in as marketmaker of last resort in index credit default swaps on the ABX.

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What Paulson should have said

Published: November 17 2008 02:00 | Last updated: November 17 2008 02:00

From Prof Perry Mehrling.

Sir, US Treasury secretary Hank Paulson's turnabout on the troubled asset relief programme ("[Tarp goes same way as superSIV](#)", November 14) leaves the valuation of illiquid securitised credit products with no floor. The proposed non-recourse lending by the Fed to buyers of asset-backed commercial paper promises only to expand further the central bank balance sheet, already more than doubled in size since Tarp was first proposed.

Such lending has not restarted securitised mortgage markets, and there is no reason to expect a different result for other securitised products. In the past, privately issued credit insurance provided the valuation backstop for these markets; but no longer, given problems at AIG and the monolines. It is time for government to step in as credit insurer of last resort.

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