**Financial Globalization and the Future of the Fed**

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The global financial crisis of 2007-2009 provoked unprecedented response by the Fed, which stepped in to catch collapsing markets on its own balance sheet—both money and capital markets, both domestic and international markets.[[1]](#footnote-1) Take it as given that the Fed, a fundamentally conservative institution, embraced its new role only reluctantly and as a genuine last resort. Take it further as given that the Fed would prefer now to return as quickly as possible to the status quo ante. The argument of the present paper, however, is that no such return is possible. The world has changed, and the Fed must change with it; that is the main lesson of the crisis.

Before the collapse of Bear Stearns in March 2008, the Fed’s principal weapon against expanding crisis was the Fed Funds target, which it reduced from 5% to 2%. After Bear Stearns, the Fed began lender-of-last-resort operations in earnest, liquidating its holding of Treasury securities and lending the proceeds to banks and broker-dealers. And then, after the collapse of Lehman and AIG in September 2008, the Fed did even more, expanding both sides of its balance sheet at the same time, lending by creating new reserves from thin air. Today, the emergency loans have for the most part run off, but a trillion dollars of mortgage backed securities have taken their place, and more than a trillion dollars of new reserves remain. The Fed’s balance sheet is not back to normal, and neither is the global financial system so narrowly rescued from collapse.

The title of the present paper is meant to suggest the historic character of the times we are living in. In practice, Bagehot’s famous rule for central banks facing financial crisis—“lend freely but at a high interest rate”—proved insufficient for modern times, and the Fed found itself scrambling for additional weapons. In previous work I have characterized this scramble as a shift from traditional lender-of-last-resort to “dealer-of-last-resort”, and from domestic lender-of-last-resort to international lender-of-last-resort.[[2]](#footnote-2) These were innovations in response to crisis, and they worked; what can we learn from them about the role of the Fed going forward?

Everyone now knows the broad outlines of what happened. Over the last thirty years, our familiar bank loan-based credit system was substantially replaced by a capital market-based credit system, sometimes called the “shadow banking system” (FCIC 2011). The epicenter of the financial crisis of 2007-2009 lay within that new system, which collapsed onto what remained of the traditional banking system, which then subsequently collapsed onto the balance sheet of the Fed and other public entities. Regulatory response to date—for example, Dodd-Frank and Basel III--has focused mainly on shoring up the traditional banking system, and so protecting the public purse from future encroachment. Regulatory treatment of the new shadow banking system was left for later.

But later is now upon us, and the question now confronts us. What is shadow banking, and how should it be regulated? The central thesis of this paper is that shadow banking is nothing less than the latest institutional form taken by financial globalization, as it has grown up over the last 30 years.[[3]](#footnote-3) It follows that the problem of regulating shadow banking is nothing less than the problem of regulating the global system of funding and risk transfer, as that system continues to evolve in the years to come.

I. **The Three Faces of Shadow Banking**

Figure 1 is a stylized picture of how the system worked, when it was working, in just six balance sheets. I give an abstract label to each of the balance sheets, rather than identifying them with specific financial firms, because often financial firms were involved in more than one of the pictured activities. I also leave out a lot of detail in order to emphasize that shadow banking must be understood as a system, not as the activity of any particular entity.[[4]](#footnote-4)

[Insert Figure 1 about here]

In Figure 1, the entity that I label as “Shadow Bank” is so called because it most closely resembles the Jimmy Stewart bank that still serves as the analytical starting point for most of us. The Jimmy Stewart bank issued deposits and used the proceeds to fund mortgage loans. The Shadow Bank issued money market instruments and used the proceeds to fund mortgage-backed securities.

The analogy can be extended. Depositors in the Jimmy Stewart bank were protected from possible bank insolvency by a deposit insurance scheme (the FDIC) and from possible bank illiquidity by a lender of last resort facility (the Fed). Creditors of the Shadow Bank were protected similarly by a private asset insurance scheme—credit default swaps—and a private liquidity put to the traditional banking system.[[5]](#footnote-5) But these were supposed to be ultimate backstops only. Just as the Jimmy Stewart bank held capital and liquidity buffers that kicked in before the government backstop, so too did the Shadow Bank. These buffers are what is most important to understand because they are what failed.

Unlike the case of Jimmy Stewart banking, the capital buffer of the Shadow Bank was not on its own balance sheet but rather in the rest of the system. Losses on the underlying mortgages were supposed to hit first the Lo Tranche, which I show as an asset held by a Hedge Fund.[[6]](#footnote-6) Second losses would hit the Mid Tranche, which I show as an asset held by a Pension Fund. The capital of these two Funds was therefore in effect the capital buffer of the Shadow Bank. Only very severe losses would hit the Hi Tranche, and the CDS backstop was there to cover this presumably improbable event.

The liquidity buffer of the Shadow Bank was also in the rest of the system. By construction, the Hi Tranche assets of the Shadow Bank were collateral for short term money market borrowing, such as term funding using Asset Backed Commercial Paper, which might for example be sold to an institutional Money Market Mutual Fund. If that buffer dried up, there was always the general repo market where good collateral could be used to raise funding at shorter term. The liquidity buffer of the Shadow Bank was thus on the balance sheet of the MMMF and the repo dealer, not the Shadow Bank itself. Only very severe liquidity crunches would impair Shadow Bank liquidity, and to cover that presumably improbable event there was the liquidity put to the traditional banking system. [[7]](#footnote-7)

From a Jimmy Stewart point of view, shadow banking thus looks like a way of doing more or less exactly what traditional banking does, but with more steps, less regulation, and no (direct) government backstop. For critics of shadow banking, it looks like a case of socially inefficient technology gaining a toehold because regulatory evasion makes it privately profitable. For enthusiasts, by contrast, it looks like a case of demonstrably superior technology gaining a toehold by finding ingenious ways to overcome inefficient and outmoded regulatory strictures. Instead of taking a position one way or the other in this ideologically fraught regulatory debate, I simply note the standoff and move on, because there are two other possible entry points for analysis, that have not been adequately explored in the literature, each of which casts the system in a somewhat different light.

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The second way to understand the shadow banking system is as a mechanism to tap global dollar funding markets for domestic mortgage lending. Put simply, shadow banking can be understood as nothing more than an adaptation of existing mechanisms of global cross-border banking to the funding needs of dollar borrowers inside the United States. Dollar funding markets have long been the go-to source for those, such as the East Asian Tigers, looking to catch up, albeit at the risk of currency mismatch.[[8]](#footnote-8) Shadow banking was just cross-border banking without the currency risk.[[9]](#footnote-9)

On the supply of funds side, burgeoning demand for dollar deposits at global banks drove the search for new lending outlets. On the demand for funds side, promotion of mortgage borrowing had long been a staple of U.S. government policy, and shadow banking was merely the next step. Well before the advent of shadow banking, Fannie Mae had introduced and promoted mortgage securitization as a way to reduce reliance on volatile bank lending by tapping deep capital markets for mortgage funding.[[10]](#footnote-10) Shadow banking merely went one step further, tapping the global money market as well as the global capital market. Private label mortgage-backed securities could never hope to be as liquid as those supported by the market-making power of Fannie and Freddie. But by funding these illiquid securities in global money markets, their promoters were able to capture a liquidity premium as private profit.

From this perspective, the Jimmy Stewart frame of the regulatory debate seems largely beside the point. The point is not whether the regulation that shadow banking was escaping was good or bad; in a sense shadow banking was not escaping anything, just tapping a new source of funds. Regulatory reform is presumably not going to shut down global dollar funding markets; it follows that it is not going to shut down shadow banking either.

This global perspective on shadow banking is, not incidentally, crucial for understanding the global character of the crisis. Why did incipient default on sub-prime mortgages, a relatively small fraction of the stock of outstanding mortgage debt, almost bring the whole system down? The Jimmy Stewart analogy doesn’t help us to understand this at all; indeed that is why most economists missed the crisis. But when we understand that this small sub-set of outstanding mortgage debt was funded in global money markets, unlike most of the rest of mortgage debt, we see the channel for transmission to global cross-border banking, and to all of the other credits that cross-border banking supports. The crisis was global because the funding was global.

From this perspective, the story of shadow banking looks like a version of our familiar experience with global credit boom and bust, which more usually involves the periphery of the global system rather than peripheral borrowers within the center of the system. Notably, in response to the crisis, the IMF created its new Flexible Credit Line as a way of protecting its members from the consequences of global funding market disruption.[[11]](#footnote-11) This time around however the disruption came from the center, and that is why the Fed was pressed into service as international lender of last resort, both directly (Term Auction Facility) and indirectly (liquidity swaps) to the global cross-border banking system.

But even this second frame is too narrow, because it takes the funding source as given. The deeper question is why there was so much available funding. The literature focuses on several possible reasons: excess saving by China, dollar reserve accumulation in the aftermath of the Asian Financial Crisis, and expansionary U.S. monetary policy. Probably each of these played some role in pumping up the global credit bubble, but for present purposes I’d like to focus on a source that has received much less attention.

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The third way to understand the shadow banking system is as the natural counterpart of the emerging system of global portfolio management, in effect a consequence of the revolution in modern finance.[[12]](#footnote-12) In traditional asset management, if you want exposure to a certain risk class then you buy risky assets that give you that exposure. In modern asset management, the same exposure can be (and in practice increasingly is) achieved by using derivatives of one kind or another, combined with holding a riskfree cash asset. This is a source of demand for cash assets that is simply not present in traditional asset management, much less in traditional monetary theory which focuses on transactions and precautionary demand. Shadow banking can be viewed as a new supply of cash assets, outside the existing deposit banking framework, that arose to meet that new demand for money.

In this regard, Figure 2 is a stylized picture not so much of what shadow banking actually looked like, but rather of what it might look like in the future. Instead of all the complicated tranching of the actual shadow banking system, which served to strip risk out of the underlying mortgage loans, I’m imagining a version of shadow banking in which all the risk-stripping is done using simple derivatives, in fact using the very same derivatives that the Asset Manager is using to achieve his desired risk exposure. The Shadow Bank is thus the mirror image of the Asset Manager not only in terms of funding but also in terms of risk. Shadow Bank liabilities match Asset Manager assets, and Asset Manager liabilities (derivatives) match Shadow Bank assets.

[Insert Figure 2 about here]

From this point of view, two kinds of financial intermediary look to be crucial to the operation of the system. First is global cross-border banking that takes care of the funding transfer; we have already discussed this dimension above as the second face of shadow banking. Second, and this dimension is new, is the derivative dealer that takes care of the risk transfer by intermediating between the Shadow Bank and the Asset Manager, serving as the derivative counterparty for both. Note that, for simplicity, I abstract from the position-taking of dealers, and show the balance sheet of the derivative dealer as so-called “matched book”. Each short position (contingent liability) is matched with an equal and opposite long position (contingent asset).[[13]](#footnote-13)

This way of thinking about the shadow banking system provides yet another perspective on the crisis. The actual shadow banking system, as pictured in Figure 1, is clearly a lot more complicated than the idealized version in Figure 2. From this point of view, we can understand the financial crisis as nothing more than the growing pains of an emerging adult shadow banking system. The problem was that the new shadow banking system had to grow on the foundation of what was already there. The fund transfer side of the system was very much ready but the risk transfer side was not, and is not.

In Figure 1, the predominant mechanism for risk transfer is tranching; financial derivatives such as CDS enter only as the ultimate capital buffer once the first lines of defense (the Lo and Mid tranches) have been breached. [[14]](#footnote-14) In Figure 2, by contrast, tranching is gone, and derivatives are the predominant mechanism for risk transfer. Similarly, in Figure 1 the predominant mechanism for liquidity backstop is reliance on MMMF and repo dealers (not shown) and an explicit liquidity put enters only as a last resort. In Figure 2, by contrast, explicit liquidity puts are the predominant mechanism for liquidity backstop, both for the global funding system (funding liquidity) and for the derivative dealers (market liquidity).[[15]](#footnote-15) My argument, in a nutshell, is that the financial crisis needs to be understood as part of a longer term evolution that is moving us in the direction of Figure 2.[[16]](#footnote-16)

II. **The Financial Crisis and Financial Globalization**

Take it as given that there was an excess supply of funds seeking riskfree deposit-like but deposit-alternative assets, and that the shadow banking system developed as an attempt to provide the assets those funds were seeking. The point to emphasize is that there was plenty of demand for the liabilities of the shadow banks but that, given the existing institutional organization of the system, those liabilities were a joint product, and there was not necessarily plenty of demand for the other products. Specifically, the literature is clear that placement of the Lo Tranche was a persistent bottleneck.

In Figure 1, I show the Lo Tranche being happily held by a credit hedge fund, which is funded by risk-loving client capital and an accommodating prime broker. Maybe that is the way the system started, but the demand for product quite soon overwhelmed the risk-bearing capacity of even the most risk-loving part of our financial system. But the world wanted riskfree deposit alternatives, and there was a lot of money to be made by providing them, so hedge funds had to be persuaded to do their part. The way they were persuaded was by providing a way for them to hedge. The technology of credit default swaps, originally developed for hedging tail risk, was adapted for this additional purpose.

Figure 3 shows one way that hedge funds were persuaded to play their assigned role.[[17]](#footnote-17) I show them holding the Lo Tranche but hedging the risk by buying insurance on the Mid Tranche. And I show them buying that insurance from an investment bank which hedges its own exposure by buying insurance on the Hi Tranche. [[18]](#footnote-18) In effect, the investment bank is acting as a derivative dealer, looking to achieve matched book notwithstanding the difference between assets and liabilities. The reason this works is that the fortunes of all three tranches depend ultimately on the performance of the same underlying mortgage assets, which means they are correlated. Correlation means you can use CDS on a higher tranche to hedge exposure to a lower tranche; the only hitch is that you have to get the hedge ratio right.

[Insert Figure 3 about here]

The crucial point is that such a hedge typically requires you (the investment bank) to buy insurance on a larger nominal quantity of the Hi Tranche asset than the nominal quantity of Mid Tranche assets you have insured. (A perfect hedge thus can easily appear, to an outsider who merely compares nominal exposure, as a directional bet.) In this way, the bottleneck in the placement of Lo Tranche gets transformed into a bottleneck in placement of Hi CDS, which bottleneck was relieved by AIG (and other insurers).[[19]](#footnote-19) Because of AIG, the key bottleneck for the expansion of the system was overcome but only for a while. When AIG pulled back, the days of remaining expansion were numbered.

There was still money to be made, however, so the system did not immediately halt in its tracks. One temptation was simply to abandon the effort to achieve matched book, which was easy enough to do since no one really knew what hedge ratio was necessary to provide a perfect hedge. Bullish investment banks were free to choose a low hedge ratio, while bearish investment banks were free to choose a high hedge ratio. If the bulls were right, they would make more money; if the bears were right, they would live to fight another day. One way to understand the crisis is that Bear Stearns and Lehman Brothers were bulls, while Goldman Sachs was a bear. But the bears could make money too, even after AIG pulled back, if only they could figure out a different way to hedge. Figure 4 shows a stylized example of how this was done, using a synthetic CDO.[[20]](#footnote-20)

[Insert Figure 4 about here]

A synthetic CDO acquires risk exposure not by acquiring risky assets but rather by writing insurance on risky assets and then packaging that insurance with a portfolio of riskfree assets and selling the package in tranches. In this way, although the CDO writes the CDS, the ultimate risk exposure is passed through to the holder of the securities issued by the CDO. In Figure 4, the Shadow Bank, now shown as an unhedged holder of the Hi Tranche, is bearing the risk that the Insurance Company was no longer willing to underwrite.

Thus, when the crisis came, the largest losses hit the issuers of the Hi CDS (AIG), the derivative dealers who got their hedge ratios wrong (Bear Stearns, Lehman), plus the shadow banks and those who wrote liquidity puts to them (UBS, Citibank). All of these mistakenly thought they were taking very little risk, and for a while the market thought so too, which allowed them to finance their positions in the global money market. When the reality of their risk exposure became clear, funding dried up and the resulting liquidity crunch caused a global financial crisis. Subsequently, the way the crisis played out was a consequence of the various backstops that the shadow banking system had in place directly within the traditional financial system, and indirectly with the government (Krieger 2011).

III. **The Past and Future of the Fed**

On September 23, 2008, shortly after the failure of Lehman and AIG, I published a letter in the Financial Times urging the Treasury to step in as “market maker of last resort in the index credit default swaps on the ABX”. (The ABX is a basket of mortgage backed securities.) Given that the AIG anchor for the system was now gone, my idea was simply to have the government step in to provide that anchor instead. For pragmatic reasons, I urged this policy on the Treasury, not the Fed, but the issue in my mind was not so much solvency as it was liquidity; like most people, I was at the time blissfully unaware of the dubious quality of the underlying assets (i.e. the upward distortion of some prices), and hence mainly concerned to halt an incipient downward liquidity spiral.

My favored policy was not adopted, although the subsequent TARP legislation provided explicit authorization for it (Section 102). Instead, the main actor was the Fed, which dramatically expanded its balance sheet on both sides, in effect substituting the impaired balance sheets of private money dealers, so putting a floor on the collapsing global money market. And then, starting in March 2009 as the emergency had begun to subside and funds were being repaid, the Fed entered as a bidder for mortgage-backed securities directly, in an operation that came to be called QE1 (for quantitative easing). Finally, as those mortgage-backed securities began to run off, the Fed entered again as bidder, this time for Treasury securities (QE2).

The Fed’s balance sheet, as of July 2011, is shown below:

Federal Reserve (July 6, 2011), in trillions

|  |  |
| --- | --- |
| Assets | Liabilities |
| Treasury securities $1.6  Mortgage securities 1.0  Other .2  TOTAL $2.8 | $1.0 Currency  1.6 Reserves  .2 Other |

Compare July 2007:

Federal Reserve (July 4, 2007), in trillions

|  |  |
| --- | --- |
| Assets | Liabilities |
| Treasury securities $.79  Other .12  TOTAL $.91 | $.82 Currency  .01 Reserves  .08 Other |

Once upon a time, before the crisis hit, the Fed basically provided funding to the Treasury, by borrowing essentially at zero and lending at the Treasury rate (largely short term bills and note). Today, in the aftermath of the crisis, the Fed’s balance sheet is about three times bigger, and its composition is also very different. There is an entirely new category of mortgage securities (MBS plus GSE debt), and the Treasury securities are now almost all long term. How should we understand this dramatic change?

Just as modern portfolio management allows asset managers to achieve risk exposures using derivatives, we could imagine the Fed doing the same. To see how the Fed could achieve the very same risk exposures using swaps, add short-term T-bills and long-term T-bonds to both sides of the balance sheet, and rearrange as follows:

Federal Reserve (July 6, 2011), in trillions, restated

|  |  |
| --- | --- |
| Assets | Liabilities |
| [Treasury bills $2.6  [Treasury bonds $2.6  [Risky securities $1.0  Other .2 | $2.6 Currency/Reserves]  $2.6 Treasury Bills]  $1.0 Treasury bonds]  .2 Other |

Three fundamental risk exposures can be distinguished. The first line is a kind of overnight index swap, in which the Fed receives the three month T-bill rate and pays the overnight money rate. There is nothing new about that exposure; only the magnitude has changed since three years ago. The second line is a kind of interest rate swap, in which the Fed receives the long rate and pays the short rate. And the third line is a kind of credit default swap, with the Fed receiving the risky rate and paying the riskfree rate. The second and third lines are essentially new, and they are big.[[21]](#footnote-21)

The point to emphasize here is the way the Fed’s balance sheet has already begun to look like what we would expect if it were acting as liquidity backstop to the system of the future that we sketched in Figure 2. In Figure 2, the global funding system and the global derivative dealer system both are depicted as requiring some kind of liquidity put, but we did not specify who was on the other side of that put. Comparing the Fed’s actual balance sheet with the idealized system of Figure 2, it seems clear that in practice the Fed was on the other side of that put. On the one hand, it has provided backstop funding liquidity for the system, just as it did before the crisis (though now with triple the outstanding position). On the other hand, it has provided backstop market liquidity for the system by taking onto its own balance sheet risk exposures that the market was not willing to hold at prices that the Fed found acceptable.

Federal Reserve (July 6, 2011), in trillions, restated

|  |  |
| --- | --- |
| Assets | Liabilities |
| Other .2 | $2.6 notional liquidity put (global funding)  3.6 notional liquidity put (derivative dealers)  .2 Other |

**IV. Conclusion**

From a prudential standpoint, both microprudential and macroprudential, the task that lies before us is the constitution of a global funding and derivative dealer system that puts in place the liquidity and capital buffers for the market-based credit system. These are not details to be added once we figure out what to do with traditional banks; the global funding banks and derivative dealers are the central financial intermediaries of our time, and must be the central concern of policy.

The technical challenge of constructing the new system is formidable, but as we confront that challenge it is important to appreciate that the political economic challenge is even more formidable. Simply put, the political economic equilibrium, established a century ago at the founding of the Fed, is no longer sustainable.

Three different bogeymen haunted the founders of the Fed: Big Government (Washington), Big Finance (Wall Street), and the Big World (foreign markets and nations). Against the first two, the founders’ design relied on the language of the Real Bills Doctrine to ensure that credit would be directed preferentially to productive uses not speculation, and to private sector uses not government. As for the third, they did not explicitly rule out international lender-of-last-resort, but only because it never occurred to them to do so. They were operating in the context of an international gold standard and with no experience of central banking, and hence with no experience of the long tradition of central bank cooperation.

However, as soon as the system was born it began to change and evolve in response to changing circumstances and challenges. World War, both I and II, was the biggest such challenge, and the consequence was a certain modus vivendi between the central bank and government, which is to say between the Fed and the Treasury. During wartime, the Fed acted as dealer-of-last-resort for the Treasury, insuring that the Treasury could always sell as many bonds as it needed by the simple stratagem of buying any that were left over. And then after the war the Fed maintained orderly markets in Treasury debt, so ensuring a privileged market position for that debt, and used the Treasury market to conduct its stabilization interventions. In this way, as the American people came to accept Big Government, so too did they come to accept their central bank as, in part, a government bank with legitimate responsibilities for government finance.

But the American people have yet to come to terms with Big Finance, much less with the Big World, both of which are at the very center of the problem facing us today. During the crisis, the Fed used mechanisms of wartime government finance to support private banks and private markets, and not just domestic banks and markets but also international banks and markets. The Fed-Treasury Accord of 1951 marked a new comfort with the emerging relationship between the central bank and Big Government. The analogous Accords for Big Finance and the Big World are, as of yet, nowhere in sight.

Figure 1: Shadow Banking as (Jimmy Stewart) Banking

Securitization Trust Investment Bank Insurance Company

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Assets | Liabilities | Assets | Liabilities | Assets | Liabilities |
| RMBS | Hi tranche  Mid tranche  Lo tranche | Loans |  |  | Hi CDS |

**Shadow Bank** Pension Fund Hedge Fund

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Assets | Liabilities | Assets | Liabilities | Assets | Liabilities |
| **Hi tranche**  **Hi CDS**  **Liquidity Put** | **MM funding** | Mid tranche | Pension liabilities | Lo tranche | Loans  Capital |

Figure 2: Shadow Banking as Financial Globalization

Shadow Bank Global Funding Asset Manager

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Assets | Liabilities | Assets | Liabilities | Assets | Liabilities |
| RMBS  CDS  IRS | MM funding | MM funding  Liquidity put | “deposits” | “deposits” | Client capital  CDS IRS |

Derivative Dealer

|  |  |
| --- | --- |
| Assets | Liabilities |
| CDS  IRS  Liquidity put | CDS  IRS |

Figure 3: Risk Transfer Development, Stage One

Securitization Trust Investment Bank Insurance Company

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Assets | Liabilities | Assets | Liabilities | Assets | Liabilities |
| RMBS | Hi tranche  Mid tranche  Lo tranche | Loans  **Hi CDS** | **Mid CDS** |  | Hi CDS (SB)  **Hi CDS (IB)** |

Shadow Bank Pension Fund Hedge Fund

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Assets | Liabilities | Assets | Liabilities | Assets | Liabilities |
| Hi tranche  Hi CDS  Liquidity Put | MM funding | Mid tranche | Pension liabilities | Lo tranche  **Mid CDS** | Loans  Capital |

Figure 4: Risk Transfer Development, Stage 2

Synthetic CDO Investment Bank Insurance Company

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Assets | Liabilities | Assets | Liabilities | Assets | Liabilities |
| MM funding | **Hi tranche**  Mid tranche  Lo tranche  **Mid CDS** | Loans |  |  |  |

Shadow Bank Pension Fund Hedge Fund

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Assets | Liabilities | Assets | Liabilities | Assets | Liabilities |
| **Hi tranche**  Liquidity Put | MM funding | Mid tranche | Pension liabilities | Lo tranche  **Mid CDS** | Loans  Capital |

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1. Although my own account of the crisis focuses on the Fed (Mehrling 2011), a rounded understanding of government response requires at a minimum also understanding the roles of the Treasury (Swagel 2009), the Federal Home Loan Bank (Ferguson and Johnson 2009), the Congress (FCIC 2011, SIGTARP 2009), and even the global dollar funding system (McGuire and von Peter 2009). In academic circles, Brunnermeier (2009), Gorton (2010), and Krishnamurthy (2010) have become standard accounts. See also the invaluable “Federal Reserve Policy Responses to the Financial Crisis” published as a special issue of the Federal Reserve of New York’s Economic Policy Review (May 2011). [↑](#footnote-ref-1)
2. Grad, Mehrling, Neilson (2011). [↑](#footnote-ref-2)
3. To my knowledge, Minsky (1987) was the first to suggest this connection as a link between securitization and globalization, but he lacked the background in finance to develop the point further. [↑](#footnote-ref-3)
4. For a more detailed account, see Pozsar et al (2010). [↑](#footnote-ref-4)
5. Observe that I treat derivative contracts as (contingent) assets of the insured and (contingent) liabilities of the insurer. [↑](#footnote-ref-5)
6. Charles Morris (2008) famously emphasized the exposure of these hedge funds as the potential breaking point of the system as a whole, on account of their leverage; he was certainly prescient about the fragility of the system, but off target about how the system would break. [↑](#footnote-ref-6)
7. To avoid proliferation of balance sheets, Figure 1 does not show explicitly the shadow bank’s source of funding (MMMF), or the issuer of the liquidity put (the traditional banking system). [↑](#footnote-ref-7)
8. Shin and Shin (2011). [↑](#footnote-ref-8)
9. The famous UBS Shareholders Report (2008) tells the tale of one such global Shadow Bank. Bank for International Settlements (2010) tells the tale of the disruption of the global funding system more generally. [↑](#footnote-ref-9)
10. Mortgage backed securities were inherently less liquid than government and corporate bonds, which competed for investor funds. So Fannie and Freddie used their borrowing power, as Government Sponsored Entities, to make markets, backstopped by the Fed. This system broke down in the crisis. The Treasury took Fannie and Freddie into conservatorship, while the Fed took a trillion dollars of MBS onto its own balance sheet. David Scharfstein (2011) surveys the current state of play regarding reform of the GSEs. [↑](#footnote-ref-10)
11. www.imf.org/external/np/exr/facts/fcl.htm [↑](#footnote-ref-11)
12. Pozsar (2011) emphasizes the empirical importance of cash pools looking for the kind of cash assets produced by the shadow banking system. In what follows, I focus on one particular, but rather generic, source of such demand. See also Caballero (2006). [↑](#footnote-ref-12)
13. For invaluable detail on the plumbing, see Singh and Aitken (2010) and Singh (2011). [↑](#footnote-ref-13)
14. Tett (2009) tells the story of the first CDS, used by J.P. Morgan originally to insure the tail risk for a portfolio of corporate loans. [↑](#footnote-ref-14)
15. The distinction between funding liquidity and market liquidity builds on Brunnermeier and Pedersen (2009). [↑](#footnote-ref-15)
16. What follows is essentially a further development of the contemporaneous account in Mehrling (2010). Gorton (2010) has a different story about CDS which emphasizes the role of the ABX index in pooling information that was formerly widely distributed, hence making public what had previously been private. In his telling of the story, this institutional innovation revealed the mispricing of the underlying mortgages. [↑](#footnote-ref-16)
17. My inspiration for this account is the story of Magnetar, told in Yves Smith (2010). [↑](#footnote-ref-17)
18. I remind you that my balance sheet headings are meant to be conceptual only. It often happened that an investment bank held the Lo Tranche itself in order to get the deal done, essentially a consolidation of the Investment Bank and Hedge Fund balance sheets. [↑](#footnote-ref-18)
19. My treatment of AIG is inspired by the account of SIGTARP (2010). [↑](#footnote-ref-19)
20. My inspiration for this account is the story of Abacus, laid out in the SEC complaint (SEC 2010). [↑](#footnote-ref-20)
21. It should be pointed out that these numbers are low end estimates of overall government exposure. Most of the implicit credit default exposure is on the balance sheet of the Treasury, not the Fed, as a consequence of its backstop of Fannie and Freddie. [↑](#footnote-ref-21)