Lurking in the Shadows:

An Analysis of the Causes of and Governmental Responses to the 2008 Financial Crisis

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Abstract: The paper presents the history, causes, and magnifying factors that led to and exacerbated financial crisis of 2007 and the subsequent collapse of the broader economy. In addition, the paper documents and evaluates various government interventions used offset falling GDP growth and mitigate the effects of failed money market channels, and based upon the analysis, there are recommendations for regulatory changes to stabilize the financial system in the future. The paper argues that the main factor underlying the crisis was a severe liquidity freeze brought about by excess liquidity from the savings glut and low interest rate policies of central banks, highly leveraged portfolios of firms in the shadow banking sector, the lack of transparency of complex financial assets, the failure of regulators to monitor and intervene as necessary, and the collapse of the subprime mortgage market. Government responses, which are evaluated in the paper, included lowering the federal funds rate, the introduction of new monetary policy tools to address liquidity and solvency problems, the Federal bailout of numerous firms in the private sector, and a fiscal stimulus packages.

Banking establishments are more dangerous than standing armies.
-- Thomas Jefferson

Approved: [Signature]

Prof. Mark Thoma
06/4/10
1. Introduction

The onset of the financial crisis can be traced to the summer of 2007, when money markets around the world experience a tightening of available liquidity. At that time, a whirlwind of events led to an economic crisis in the United States, quickly spilling over to the rest of the world. The US had not faced such a recession, nor has government intervention been so aggressive, since the Great Depression. The economic downfall was worldwide due to widespread international dependence on the health of the US economy. Within the US the downturn was deep and far-reaching, and it’s not over yet.

It is difficult to pinpoint a singular cause of the crisis is difficult due to the complexity of the global economy, and because it may be the result of several failures in combination rather than a single dominant cause. Prime suspects behind the freezing of worldwide liquidity in money markets noted above include lack of regulation for the shadow banking sector, the housing bubble in the US, low interest rate policies of central banks, and the savings glut in Asia. Moreover, profit maximizing incentives and a general cultural attitude to “live beyond one’s means” created an economic environment primed and ready for collapse.

Trust played a major role in the economic downturn. As default in subprime mortgages increased and the quality of the assets backing securities came into question, the valuation of financial derivatives held by many financial institutions became increasingly difficult, and this was made even worse by the lack of transparency inherent in many of these assets. Banks were writing down the value of asset-backed securities on their balance sheets on a continual basis, and as a result, the banks holding those assets were forced to come up with cash or post more assets as collateral to settle debts to their creditors. In addition, they also began hording reserves against further losses and this also reduced liquidity in these markets. Banking institutions
became increasingly reluctant to lend to others due to perceived increase risk in lending. Ultimately, the money markets across the globe failed due to the evaporation of available short-term liquid capital.

The following is a chronological history, causes, and government responses to the crisis and the government responses to it. This is followed by an assessment of the responses and concluding remarks. The paper focuses on the events leading to the liquidity freeze, and the monetary policy responses of the Federal Reserve (Fed). Fiscal activity and actions taken by the US Treasury will also be addressed. The main goals of the paper are to analyze the possible causes of the current crisis, and to evaluate the responses of the Fed to this current crisis. Additionally, the paper will identify which policies worked and which policies failed so that a catalogue of effective methods for mitigating future events similar to those we are now experiencing is available.

2. A History of the Crisis

The source of the credit crunch is not due to the failure of traditional banks; instead the crunch emerged from the activities of the shadow banking system over the last few decades.¹ The widespread involvement of major players in the financial industry, as we shall see, is an indicator of the severity of the recent global economic downturn. The following section chronicles the financial crisis and includes a discussion of exacerbating activities of firms central to the crisis.

2.1 BNP Paribas Freezes Redemptions

Problems began in the summer of 2007 when BNP Paribas, a French bank froze redemptions on three hedge funds that it managed.² In an August 9th press release, the bank

¹ Further discussion about the differences of the banking systems can be found in Section 3.
² Hedge funds use a broad variety of financial strategies in an attempt to make a large return for the investors and the fund managers. Hedge funds are similar to mutual funds, however, to avoid
announced, "[t]he complete evaporation of liquidity in certain market segments of the US securitisation [sic] market has made it impossible to value certain assets fairly regardless of their quality or credit rating" (BNP Paribas 2007). The portfolios of these hedge funds were altogether valued at about $2.1 billion, and many of the securities that comprised the funds were subprime mortgage backed securities from the United States (Boyd 2007). When default rates of these subprime mortgages began to rise, the net value of these funds could not be calculated for reasons discussed below. Therefore, prices of the funds could not be determined and buyers and sellers could not trade. Trading occurs because of the difference of valuation between a buyer and seller. However, a market fails when no price standard exists for a good.

The financial products backing BNP Paribas' hedge funds were the source of the problem. About one third of the $2.1 billion portfolio was comprised of mortgage-backed securities (MBS) with credit ratings of AA or higher. With the subprime crash in the US, the trust of investors deteriorated.\textsuperscript{3} As a result, BNP Paribas halted redemptions from its investors before its fund's members attempted to pull every cent from the fund that they could. The firm made this decision to avoid a run on the fund, which would be much akin to a run on a depository bank. Hedge funds like this one are able to stop its members from withdrawing their assets because the funds do not operate under the same guidelines as a traditional bank. Therefore, the fund is not required to hold capital against its liabilities to guard against a risk of a run on the fund from investors.

regulation, the number of investors in a fund is limited and they cannot make public offerings. Additionally, the investors must be credit worthy to avoid registration under the Securities Act of 1933 (Stulz, 2007). Because of the limited size, investors usually must pay a large amount to enter in to the fund (between $250,000 to $1 million). Unlike mutual funds, hedge funds are mostly unregulated. Because of this, trading is complex and convoluted. The fund managers have the ability to use financial derivatives, leverage, swaps, and short selling to hedge the fund against losses, but at the same time increase the risk of the portfolio for larger gains.\textsuperscript{3} The MBS is described in Section 3.
2.2 The Problem Spreads: Bear Stearns

Bear Stearns was a pioneer in the buying and selling of asset-backed securities (ABSs), which was part of its downfall. The firm was involved in virtually all types of financial derivatives.\(^4\) Similar to BNP Paribas, during the first part of 2007, the firm’s High-Grade Structured Credit Strategies Enhanced Leverage Fund began to feel pressure from increasing defaults on the mortgages backing its securities. As of April 2007, the value of the fund had decreased by 23% for the quarter mostly due to the defaults of subprime mortgages (Goldstein 2007). Furthermore, on June 1 of that year, Standard and Poor’s (S&P) and Moody’s downgraded over 100 bonds backed by subprime mortgages (St. Louis Fed). The credit rating downgrade added to an already unstable financial atmosphere and the soundness of the value of many financial derivatives came into question.

Another major problem with Bear Stearn’s structure was the amount of leveraged assets on its books. Nearing the end of the investment bank’s life, the firm was leveraging their assets to their debt by about 35 to 1 (Boyd 2008). For every dollar invested by the company, they would borrow another thirty-five. Leverage creates potential for huge gains when the investment increases in value, but there are large losses when the investment turns for the worse. Additionally, as the company was borrowing more and more money on the same asset base, it was not holding reserves to serve as a buffer in the case of an economic downturn.

As the subprime mortgage market began to experience increasing rates of default, Bear Stearns’ fate was apparent. The company was forced to put up more capital and assets to cover the loss of value to their creditors. Bear Stearns’ creditors wanted more cash in reserve because

\(^4\)Bear Stearns engaged in: investment-grade structured finance securities; ABSs, MBSs, global structured asset securitizations, derivatives, options, futures, forward contracts, currencies, and swaps.
of the loss of collateral. As a result of this and other factors, the liquidity in the company dried up. The actions the company was forced to take as a consequence made the problem even worse. The increasing number of defaults and late payments on the subprime mortgages drove the value of the subprime MBS down. Bear Stearns was forced to sell more of the MBS for cash to back their other collateralized debts, driving the price of the MBS down even further. Bear Stearns’ only solution to its liquidity position created a negative feedback loop that exacerbated the investment firm’s problems.

The increasing pressure on Bear Stearns from subprime mortgage default forced the firm to halt redemptions on its hedge funds on June 7, 2007. Halting redemptions means the participants in the fund could not cash out; they were forced to sit on their investments and wait to see what happened.

The short-term borrowing used to support high-yield long-term lending that kept the investment company thriving was unavailable as nobody would lend to it due to the problems it was experiencing. As a result, the company filed for Chapter 11 bankruptcy on July 31, 2007 and liquidated the fund. The following week, BNP Paribas made the announcement that it was halting the redemptions on its funds and the crisis was well under way. The situation of the two banks sent a daunting message to others involved in subprime securitization.

The Fed and JP Morgan Chase & Co (JPMC) made a bold move on March 13, 2008 with the announcement of a bailout for the struggling investment firm. The Federal Reserve Bank of New York (FRBNY) agreed to extend a term finance loan to JPMC for the acquisition of Bear Stearns. On June 26, 2008 credit was extended to Maiden Lane LLC, a secured lending facility in Delaware managed by the FRBNY, to control $30 billion of Bear Stearns’ portfolios. The
terms of the loan transferred management of the assets to the FRBNY. Further discussion of this credit facility follows in the section describing the policy responses to the crisis.

2.3 Lehman Brothers Closes its Doors

Lehman Brothers Holding Inc. was a financial holdings company that operated worldwide. Lehman Brothers entered into the subprime mortgage market as the housing bubble was expanding after 2001. Between 2003 and 2005, the company expanded its position in the subprime mortgage market by acquiring the companies Aurora and BNC Mortgage. Lehman Brothers reported record net income of $4.2 billion and reported total assets of about $600 billion in 2007 (Investopedia 2010). The same year, Lehman securitized $85 billion worth of mortgages, an amount that was four times their shareholder equity.

As losses began mounting at the beginning of 2008 due to rising default in the home loan sector, the company began facing problems similar to the problems Bear Stearns faced in 2007. The source of their problems stemmed from the use of short-term debt to finance operations and the excessive use of leverage. At the time of the crisis, Lehman had leveraged their assets nearly 30 to 1. The firm’s dependence upon short-term debt for financing due to its highly leveraged position left them in a vulnerable situation once the housing bubble popped and default from holders of subprime mortgages began increasing. The value of many of Lehman’s assets was dropping, and the usual market players were not willing to lend it the cash it needed to fund its operations.

When the Bear Stearns hedge funds were liquidated, the value of Lehman’s stock dropped. Then, the next spring when Bear Stearns almost failed, Lehman’s stock prices dropped again due to lack of consumer confidence. The high amount of leverage proved to be devastating to the company since the company’s portfolio was made up largely by subprime MBS. The
market conditions placed the firm into a tough situation. Since the firm relied heavily upon the issuance of MBSs and participants in the money markets were becoming leery of these types of securities, the firm struggled to meet its short-term debt obligations. It also struggled to finance other parts of the business’ activities. After significant losses, on September 15, 2008 the company filed for Chapter 11 bankruptcy, marking one of the largest bankruptcy filings in history. After Lehman filed for bankruptcy, the net asset value of its shares fell below $1. The failure of this money market fund spread uncertainty across the market and greatly exacerbated the financial crisis (Zingales 2008).

The Lehman Brothers collapse spread fear throughout financial markets worldwide. The value of many assets was being reevaluated, but lack of transparency made it difficult to know where the values would settle and this created considerable fear and uncertainty. Lehman’s failure made investors gun shy about the value of assets in all sectors of the market. The Government had saved Bear Stearns, but not Lehman, and the failure to save Lehman coupled with lack of transparency changed the game. People were not willing to leave their money at risk anymore since there was no longer an implicit guarantee, and the equivalent of a massive bank run on the shadow banking sector ensued, a bank run that demonstrated how much fear the Lehman collapse had generated. Fear, lack of transparency, and lack of implicit guarantees caused people to flee to the safety of government bonds, if they could get their hands on their assets and make the trades, and trading in short and long-term money markets came to a near standstill.

2.4 A Giant Falls: AIG Financial Products Cannot Meet Its Obligations

American International Group (AIG) is a large and diversified financial company. The firm is a holding company that, through its subsidiaries, engages in insurance and non-insurance
related activities in the US and internationally. AIG operates in more than 130 countries, has 116,000 employees globally, and has 74 million customers. In the US, it has about 30 million customers, 50,000 employees, and provides insurance to about 180,000 small businesses and corporations. These businesses employ over 106 million people in the US. Along with its on-balance sheet operations, AIG is a large participant in the derivatives financial market through its AIG Financial Products (AIGFP) unit. Provisions for interactions with counter-parties in derivative markets require that the company posts more collateral to guarantee its credit obligations in the event of a credit rating reduction. However, AIG was not required to hold capital reserves against its liabilities. Since the company used leverage to enter into short-term agreements using its assets, when the value of those assets was reduced, the company faced a struggle to honor its debt to its creditors.

After a credit downgrade in the second half of 2008, AIG faced a liquidity crisis. Because of the structure of the financial industry, shadow banking firms with high ratings could enter into credit swaps without depositing collateral. A credit default swap (CDS) is akin to insurance. The buyer pays a premium on the asset, and if an event occurs within the terms of the swap (e.g. a credit rating downgrade), a sum of money is paid from the borrower to the lender. Once AIG’s credit was downgraded, the firm had to post more collateral to cover credit swaps with the counter-parties involved. The CDSs are used for borrowing short and lending long. AIG would run a large debt to finance their operations and leverage their assets to pay for it. However, when the short-term money became unavailable, they had a problem. In a letter to the Rep. Darrell Issa of the Committee on Oversight and Government Reform, Federal Reserve Chairman Ben Bernanke stated, “[t]he CDS protection that AIG had written on multi-sector CDOs was a significant source of AIG’s capital and liquidity strains during 2008” (Bernanke, 2010). No
money was available to repay debts to their counter-parties and the company was on the brink of disaster.

In June of 2008, the company held more than $1 trillion in total assets along with stockholder's equity of $78 billion. The company's losses in 2008 totaled approximately $99 billion with fourth quarter losses of approximately $62 billion. A significant amount of those losses came from holdings in the company's insurance subsidiaries. The remainder of the loss was associated with the mark-to-market transferring of certain assets to two government sponsored limited liability corporations (LLCs), Maiden Lane II and Maiden Lane III. The two LLCs, which will be discussed in further detail later, were authorized by the Board of Governors to extend credit to AIG, placing toxic assets onto the Fed's balance sheet in a way that is similar to actions taken with Bear Stearns.

AIG's problem began when the value of many of the assets backing their obligations dropped due to default in the residential mortgage market. They were not required to hold reserves against the value of their debt. When loans were going into default, AIG quickly ran out of money to pay for the losses even after drawing from all parts of its business. This liquidity freeze greatly added to the crisis in the rest of the financial market. With the imminent failure of the company, a laissez faire approach to AIG's situation from the Fed was deemed too much of a risk to the health of the already staggering US economy.

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5 Mark-to-market accounting values an asset at the current market value, rather than the book value from the original cost of investment. The value of assets on a balance sheet can fluctuate based on market conditions.
2.5 Fannie Mae and Freddie Mac Needed a Helping Hand

Congress approved the creation of two government-sponsored enterprises (GSEs) known as Fannie Mae and Freddie Mac. Congress approved Fannie Mae, or the Federal National Mortgage Association, in 1938 and approved Freddie Mac, or the Federal Home Loan Mortgage Corporation, in 1970. The purpose of the GSEs is to increase the availability of credit in multiple sectors of the economy such as housing, education, and agriculture. The GSEs are financial intermediaries that purchase loans from primary lenders. In doing so, they create a secondary market and allow primary creditors to increase the volume of loans offered by assuming the risk and freeing money to be lent again. The residential borrowing segment is the largest of the segments in which the GSEs operate, providing liquidity, stability, and affordability in the housing market.

Fannie Mae and Freddie Mac issued their own MBS, and they also purchased MBS from other dealers to increase the available liquidity to money markets. Congress approved the GSEs in order to generate trading and reduce costs in the residential markets. However, early in 2007, Freddie Mac announced that it would no longer purchase the most risky subprime MBSs due to the increase in delinquencies of subprime. The announcement was an indication of the instability of the security markets, and it foreshadowed the actions of many players in the secondary market for months to follow.

Many institutions use MBSs issued by the GSEs as collateral and therefore the government took action to ensure the safety and soundness of those securities. On September 7, 2008 the Federal Housing Finance Agency placed the GSEs under government conservatorship. The new policy contained three components to ensure a positive net worth for each entity, a new secured lending facility, and a temporary program to purchase MBS from the GSEs.
Both Fannie Mae and Freddie Mac struggled throughout 2008 and 2009. The Director of the Federal Housing Finance, Edward J Demarco, has been the conservator of both GSEs since September 6, 2008. He makes requests to the Treasury for funding based on the quarterly activity in the firms to maintain a positive net worth. The FRBNY was authorized to extend credit to the GSEs and the Treasury was authorized to purchase debt obligations from the GSEs by the Economic Stimulus Act of 2008. The Treasury began purchasing MBS from the GSEs on January 5, 2009 the GSEs allowable debt outstanding is $1080 billion until December 31, 2010.

On February 18, 2009, President Obama announced the Homeowner Affordability and Stability Plan. This allows refinancing of conforming home mortgages owned or guaranteed by the GSEs that exceed 80% of the value of the home. Also, the Treasury increased preferred stock purchase agreements to $200 billion and increased the limit of the size of the GSEs portfolios with the FRBNY to $900 billion.

3. Possible Causes

Liquid capital has been making markets more efficient since it first evolved from a barter system. Instead of lugging around a satchel laden with heavy coins, people began making deposits at a metal smith and thus could use an equivalent of a modern day check to transfer coins to different accounts with the smith. Soon, people began writing out slips that simply were honored as an “IOU” to whoever held the slip, and thus fully backed currency was born. The problem of coincidence of wants that plagues the barter system had been overcome and people were able to trade with less search time since the IOUs were an acceptable store of value and medium of exchange.

Eventually, the smith realized that he had a lot of gold deposits that were merely sitting in his vault that he could lend out. As long as he had enough gold coins remaining to meet the
demand of other withdrawals, then he could lend without concern. Knowing this, the smith decided to lend some gold coins to a farmer who could then buy grain to raise and sell. Furthermore, the shopkeeper that sold the farmer his grains can either spend the coins or deposit the coins back into her account with the smith. The smith made funds available to the farmer that otherwise would have been unavailable. Without the loan, the farmer could not buy the seed, and thus the shopkeeper would not enjoy business from the farmer.

The banking industry had been born, along with financial innovation. The evolution of banking and the use of money improve efficiency by increasing the available liquidity to the market participants. The banking system has changed drastically since the first metal smith began offering loans against deposits of gold coins in its vault. Today, tools such as short sales, repos, leverage, and collateralized debt are used regularly. The desire for more wealth drives investors to develop new ways to create and trade assets. The use of new financial tools comes with its risks, however. Paul Krugman describes that “[b]anks are wonderful things, when they work. And they usually do. But when they don’t, all hell can break loose” (153). Banks were not working and it seems that starting in 2007 hell’s gates were opened upon global financial markets. The events that came to fruition during the recent and continuing crisis demonstrate loudly and clearly that when financial tools go out of control, it can cripple the economy. The following is an assessment of the actions that brought about our recent and continuing financial crisis.

3.1 Derivatives, Leverage, and the Role of the Shadow Banking System

The financial innovations that magnified the crisis are not part of traditional banking. Instead, they exist in the realm known as shadow banking. The firms within this system act as intermediaries between investors and borrowers, e.g. they borrow short or take short-term.
deposits, and then lend long just like traditional banks. However, they are not defined as financial institutions and therefore are not under the same regulations as commercial banks. Many of these “shadow banks” sell commercial paper to borrow money to reinvest in long-term credit financial derivatives with higher yields. In early 2007, transactions within the shadow banking system were estimated to be about $10 trillion, which was nearly the size of the traditional banking system. The types of activities in which the shadow banks engaged magnified the financial crisis of 2008, but were also part of the recovery. The facilities created by the Fed used similar methods to insert money into the system and encourage growth.

Shadow banking institutions operate in a similar way to traditional financial institutions. A typical commercial bank borrows money from its depositors to lend out as mortgages and other types of interest bearing loans. Since depositors can withdraw their money at any time, and since there is considerable turnover in these accounts, the deposits are mostly short-term. Likewise, firms like Bear Stearns and Lehman Brothers used short-term debts to finance long-term loans. The difference though, lies with how borrowed cash is used and the capital requirements that each type of institution must meet. State and federally chartered banks have strict reserve requirements that must be held against deposit liabilities at all times, whereas shadow banks are not forced to meet such requirements. The lack of capital requirements and lack of regulation of leverage and the quality of assets the institutions were holding proved to be a forbidding challenge for the survival of our financial markets.

The source of the liquidity problem lies with activities that large financial institutions engaged in; activities involving credit default swaps (CDS), collateralized debt obligations

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6 Corporations and banks issue commercial paper to finance short-term activities. The agreements are usually for 2 to 270 days and are not backed by collateral. Since the agreements are based on faith, mostly firms with high credit ratings participate in the activity.

7 Alistair Barr, Market Watch, Dow Jones, 2008.
(CDO), and other asset-backed securitization (ABS). Financial tools like these create liquidity throughout the financial market; however, as explained below, they can also lead to a global financial shutdown.

Originators of loans use their primary interest in underlying collateral in the construction of new financial assets, which are sold to investors on a secondary market. When mortgage payments are used in the construction of the financial asset, the product is known as a mortgage-backed security (MBS). The construction of an MBS begins when the originators of loans choose to bundle expected loan payments and sell the payment rights to investors for cash. Purchasers of MBSs receive the bundle of interest payments from the mortgages backing the security. Additionally, the purchasers receive principal payments on the loans in the event of prepayment or refinancing of a mortgage.

Simply put, an MBS creates a new product out of debt owed to a lender. Consider a mortgage for thirty years: the bank that issued the loan expects payments from the holder every month until the terms of the loan are satisfied. The bank can separate expected loan payments from a homeowner out to the last payment at the end of the thirtieth year and sell bundles of the payments to investors for cash on the secondary market. The investor who purchases the bundle now receives the interest payment on the loan, and internalizes all of the associated risks. As time increases, so does the risk of owning the payment rights for a loan. It is difficult to predict how a homeowner will act over the next thirty years. Additionally, investors do not deal directly with the client holding the mortgage. Therefore, they put their faith into the originators of the loan, expecting and hoping that the debtors of the loan are creditworthy and can actually afford the house. Notice too that this "slicing and dicing" process that creates new securities also makes
it hard to identify what it is made of. This lack of transparency makes it difficult to evaluate the risk of the asset due to default on the loans that were sliced and diced in its construction.

Another part of the shadow banking system is the structured investment vehicle, or SIV, which is referred to as asset-backed commercial paper (ABCP). The asset is similar to a CDO; however, the difference is the type of debt used to create the asset and the term of the instrument. Pools of assets such as MBSs and CDOs back these vehicles, and they issue short-term debt (less than 270 days) rather than long term like MBSs or CDOs. The entity borrows money by issuing short term, low-interest securities and then uses that money to buy long-term high interest securities. Thus, the investor profits from the difference in interest. What these financial products all have in common is the lack of transparency and the difficulty in the valuation of each, both of which are addressed below. Bear Stearns, Lehman Brothers, and AIG all used these financial products extensively.

Some shadow banks would, for example, sell commercial paper in the short-term money markets. Instead of placing the cash in a vault, depositing it at a Federal Reserve Bank, or loaning it out again as a mortgage, they would purchase MBS and other ABS in order to earn interest payments from those assets. AIG would borrow money by selling CDOs to investors. When a CDO is sold, each party is making a bet about whether the value of the assets backing the CDO will go up or down. The problems for AIG resulted from defaults on loans backing the MBS from which the CDOs derived their value. When the value of the CDO drops, the borrower (like AIG) must post more collateral against those obligations or pay the difference outright. Businesses involved in such activities were not required to hold cash and liquid assets as reserves to ensure repayment to their depositors in the event of losses on their investments. Rather, profit-seeking attitudes dominated the behavior of those on Wall Street, who used the guarantee of a
government bailout as justification for making risky decisions with money that did not belong to them.

The assumption was that market pressures would ensure adequate reserves, and therefore there was no need for regulation over these investment institutions. However, as the shadow banks continued to borrow short and lend long, the ratio of debt to assets, or leverage, in these institutions increased. These firms were continually borrowing more money against assets on their balance sheets in an attempt to earn larger returns. With no limit on leverage or capital requirements, the firms were able to continue to borrow and lend without hindrance. The pitfall of leveraging assets became clear as defaults in subprime mortgages in the US continued to mount. The availability of liquid capital and assets to repay these short-term debts quickly dried up and created wariness about the value of assets across the globe. Common activities in a healthy financial system were becoming increasingly difficult as liquidity dried up. Inter-bank lending was coming to a standstill and the Fed’s usual tools seemed powerless against the slowdown.

3.2 Slicing and Dicing: What is in the New Assets?

The MBS investors assume risks that, given the complexity of many MBSs, are difficult to evaluate. In other words, the securities are not "transparent." Professor Mark Thoma of the University of Oregon described the problem with an MBS as lack of transparency. He said an MBS is like a sausage, after all of the ingredients are chopped up and mixed in, it is hard to tell what the sausage is made of (Thoma).

Over the last fifteen years, the amount of MBS issued has been increasing, particularly, MBS backed by subprime mortgages. Rosen from the Chicago Fed states, "[f]rom 1996 through

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8 Firms aim to differentiate their portfolios so that profitable assets can offset losses due to unexpected changes in market conditions.
2006, the share of subprime and Alt-A MBSs rose from 47% to 71% of total private sector MBS issuances.” The shadow banks were making more and more sausage, increasingly using ingredients that were more likely to spoil.

To make things worse, with increasing levels of securitization, unwinding the packages becomes more and more difficult since payments to owners of MBS come from original borrowers of loans. In other words, increasing securitization decreases the transparency of the asset. The more “slicing and dicing” and repackaging of debts, the harder it is for an investor to trace the security back to the originator of the loan. Therefore, the investor cannot truly calculate the probability that that person will default on his or her obligation. The greater the disconnection between the holder of the ABS and the originator of the loan, the harder is the assessment of the actual value of that asset.

The repackaging of original loans into new securities—securitization as it is known—does not have to stop with the first bundling of assets. Investors can also resecuritize their MBS into an entirely new financial asset. A collection of the securities can be bundled and resold as a collateralized debt obligation (CDO). A CDO is a type of bond that uses other bonds as collateral against losses. Additionally, CDOs are also split into different tranches and priced accordingly.

Tranches are separated based upon risk. The value of a tranche is based upon the items that back it and, thus, different levels of tranches represent different qualities of the financial products. Each tranche is split based on the rating of the loans behind it (AA, A, BBB, BB, etc…). The top tranche, the senior tranche, is made up of subprime and Alt-A mortgages with AAA ratings. Those tranches below the senior tranche increase in risk and decrease in value. The securities are packaged so that the senior tranche will absorb losses last and receive prepayments first.
Consider a city block with three buildings standing on it. One building is made of brick, one of wood, and the other is made of straw. If a fire were to spread over the block, the straw house would most likely burn first and the brick house would be the most likely to survive. In this example, the brick building represents a senior level tranche, the one that is the most sound and secure. The other buildings decrease in the stability of the materials that comprise them, and therefore also decrease in their value and security.

Investors holding financial derivatives can experience problems when interest rates change unexpectedly, when there is early repayment, and when there is default on mortgages. All investors face the first problem: unexpected interest rate changes. The value of bonds is inversely related to the interest rate, and hence, interest rate changes result in capital gains or losses. The second problem is early repayment. If the principal of the bond is paid down early, future interest payments will be lost. This is likely to happen when interest rates are lowered, because borrowers would likely choose to refinance at the lower rate and repay their loans this way. The third problem is default. This was a major part of the 2008 crisis since the default risk on mortgages backing these securities can harm both the investor and issuer.

It was the third problem, default, that BNP Paribas and others felt most acutely. When the default rate on mortgages began increasing, the issuer of the sliced and diced securities backed by those loans had to put up either cash or other assets to meet the margin call from the investors.\(^9\) This is where the lack of regulation and capital requirements mattered. Since these firms did not face regulatory capital requirements, the amount that they could leverage their assets had no limit, a fact that was exploited. Consequently, when losses began mounting, there were no reserves available to cover them.

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\(^9\) A margin call occurs when a broker demands either cash or assets from their customer to make up for a decrease in value of a security.
Since the firms had inadequate reserves, in order to meet the margin calls, they had to either borrow money or sell assets. But from whom would they borrow? These institutions did not have the option to borrow from the Fed, as the discount window is available only to member banks. Additionally, other regular sources of money lost faith in the market and chose to sit on cash instead of lending it. As a result, banks that thrived on borrowing short had a difficult time finding the cash they needed to meet the margin calls from their creditors. Consequently, many firms had no choice but to sell assets to raise the needed cash. However, the sales magnified the problem. The flood of assets onto the market drove the price of those assets down, resulting in more margin calls and more assets dumping, which drove prices of those products down further. As DiCecio and Gascon state: “[s]ince the summer of 2007, financial market turmoil has increased the demand for riskless, liquid assets and dried up liquidity in key markets.” As short-term liquid capital began to dry up, global financial markets began to shut down.

3.3 Ingredients for Disaster—Bubbles, Legislation, and a Savings Glut

Low interest rates pursued by central banks in the wake of the dot-com bubble in 2000, along with the savings glut, made large amounts of liquidity available to invest. The influx of new investment in the technology sector in the late 1990s had helped sustained growth in the US economy. Once the bubble burst, investment from the tech industry fueling growth ceased so the Fed sought other methods to stimulate the economy. Former Federal Chairman Alan Greenspan decided to lower the primary discount rate to inject liquidity into the system. The decrease in the interest rate, along with the large amount of savings in Asia and the Middle East, helped to fuel a new bubble in the housing market. The increased availability of reserves in the system caused the expansion of the housing market as consumers flocked to take advantage of low borrowing costs.
and increasing house prices. The housing bubble replaced the dot-com bubble and the expansion of credit began.

The low interest “teaser-rates” for mortgages encouraged people to obtain new home loans and the new demand drove prices up. Increasing home prices made home ownership more enticing, and as more and more houses were purchased, the prices continued to increase. Rising home prices became a self-fulfilling prophecy. Buyer’s and seller’s expected prices to increase, and those expectations were validated.

As more and more people entered the housing market in response to the apparently attractive terms and rising values, they fed the housing bubble, which led to an artificial increase in value. Additionally, designers of mortgages were focusing on short-term gains and personal incentives for profit. Firms were extending loans to persons that were not necessarily creditworthy, and then passing the loans along to the financial market where they were securitized and somehow, through slicing and dicing, supposedly made safe.

Gary Becker states in his blog that the housing bubble began in the early 1990s and reports that “[…] real housing prices in the United States went up on average by about 10% a year for six or seven years, and then crashed after 2006 to erase much of the previous gain” (Becker, 2010). If he is correct, Lehman Brothers, Bear Stearns, and AIG had been structuring their business around false value for almost 17 years before the bubble collapsed! Every financial derivative was potentially valued based on value that was inflated by this false expectation of ever rising housing values.

Cutting the interest rate in 2001 was not the only source of growth in the housing market. Another factor that was keeping long-term interest rates low, thus encouraging growth and credit expansion, was what Chairman Bernanke calls the Asian savings glut. After the Asian crisis
throughout the 1990s, some affected countries, namely China, began collecting reserves of safer foreign currency, like the dollar and the euro. Hording reserves hedged their own currency against future shocks and preserved the value of the country’s domestic currency. The increased demand of US Treasuries and bonds due to increased saving from international sources drove the price of those assets up and effectively kept long-term interest rates down. Lenders were increasing the volume of mortgages issued because of the perceived low risk and increasing prices in the housing market. Borrowers, believing home values were rising, continued to seek funds from banks to purchase a new home. Between low interest rates and high demand, the housing market appeared to be safe and growing. More and more loans were being extended, especially subprime mortgages.

Profit incentives enticed many big banks to engage in excessive lending. Market conditions seemed relatively safe, so lending institutions broadened the spectrum of acceptable borrowers. Low interest rates from Fed policy and the Asian savings glut created an environment that was seemingly safe. By 2006, the proportion of mortgages issued that were considered subprime accounted for nearly 20 percent of newly extended mortgages and totaled $600 billion (Mizen 2008). At the same time, the shadow banks were issuing more MBSs, CDOs, and CDSs. Banks were placing more and more mortgages into the hands of consumers disregarding the quality of the consumers and the shadow banks were constructing financial products from the same loans.

The third magnifying element of the crisis was the increase of securitization, particularly using subprime mortgages. The banking industry was not focusing on lending to businesses and households to encourage growth. Instead of lending out incoming payments from loans, many institutions chose to securitize the payments to sell for profitable gains. The extensive use of
securitization, buffered by increased subprime mortgage issuance between 2002-2006, acted to build a financial system based upon false beliefs. Credit rating agencies granted high ratings for these financial products and fueled the increasing use of securitization. Joseph Stiglitz compares US credit rating agencies to alchemists from the Middle Ages. He states, "[m]odern alchemy entailed the transformation of risky subprime mortgages into AAA-rated products safe enough to be held by pension funds" (6). Stiglitz believes that credit rating agencies were leading people to put faith in overvalued assets. Essentially, such agencies were creating the perception that these securities were backed by gold, when in fact the assets were only worth the pebbles that backed them.

Another possible magnifier of the crisis was the Gram-Leach-Bliley act of 1999, which repealed part of the Glass-Steagall act of 1933. The Glass—Steagall Act was created in response to the Great Depression in order to increase banking stability. The act was passed under former President Franklin Delano Roosevelt with the intention of separating investment banking from commercial banking. The passing of the new act enabled a company like AIG to bring all of its subsidiaries underneath one roof. AIG could use the consolidated assets from all parts of the company as leverage for borrowing with its off-balance sheet SPVs transactions. The company increased its collateral for borrowing and could do so in a way that protected the rest of the company from liability.

There are differing views concerning the effect of the new act. Some believe that Gram-Leach-Bliley paved the way to the crisis. Proponents of the Act believe that it actually made the recovery from the crisis easier. Former President Bill Clinton argues that allowing commercial banks to enter into the same activities in which investment banks engage in adds to long-term stability; whereas, President Obama claims that former Senator Phil Gram, one of the writer’s of
the Act, helped to construct the system that is now in shambles (WSJ 2008). Since the institutions primarily involved with the crisis were originally unregulated, the passing of the act cannot be the source of the liquidity freeze; as those institutions were already engaged in activities like securitization long before its passing. However, the act did enable shadow banks to expand their available assets for collateral, so the Act most likely played a magnifying role.

4. Call to Action: The Government Response

The world faced new problems in the recent crisis. Because the crisis started in the shadow banking sector where the Fed had very little authority, and because it involved new and complex types of financial products that bypassed traditional avenues the Fed can influence with policy, the Fed’s traditional methods for curbing a downward business cycle were inadequate. Therefore, new monetary policy tools were introduced and used along with the traditional procedures for such situations. The Fed was making its most dramatic move in over 70 years: “[w]ith these [new monetary policy tools], the rescue is truly historic, since for the first time since the 1930s it extends Fed bailouts beyond banks that are under the Fed’s direct supervision” (Shiller 90). The following chapter discusses the new tools and their intended effects. An evaluation of the various tools is also included in a later section.

4.1 The Fed’s Primary Policy Tool — The Target Interest Rate

Tightening credit conditions and increased uncertainty exacerbated deteriorating financial market conditions as an increasing number of investors were choosing to sit on their money rather than risk loaning it. The Federal Open Market Committee (FOMC) believed, “[…] that the downside risks to [economic] growth [had] increased appreciably” (Board 2007). And, on August 17, 2007, following the announcement from BNP Paribas, the FOMC agreed to reduce the
primary credit rate by 50 basis points to 5.75 percent.\textsuperscript{10} This reduction brought the discount rate within 50 basis points of the FOMC's federal funds rate.\textsuperscript{11} Additionally, the FOMC decided to increase the term of primary credit loans from overnight to 30 days.

The Fed made these efforts in an attempt to boost the economy and curb threats to growth. Lowering the discount rate reduces the cost of borrowing for member banks.\textsuperscript{12} If the price of an item (including money) is lowered, then demand for that item should increase. The Fed began lending at a cheaper interest rate, in a hope to revitalize short-term borrowing from member banks. The intent is to make funds available in the financial system as the availability of funds from other sources evaporates. Indeed, firms were facing increasing difficulty in borrowing short and lending long, resulting in foregone investments. However, this action did not fix the problem, and about a month later both the primary discount rate and the federal funds rate were decreased another 50 basis points as market conditions continued to decline. Cutting these interest rates became a continuing pattern throughout the crisis.

The Emergency Economic Stabilization Act of 2008 allowed the Fed to set the rate of interest paid on required reserves and excess reserves held by depository institutions. This occurred on October 1, 2008.\textsuperscript{13} The act effectively set a floor on the Fed's discount rate at 0.25 percent and was intended to "[…] essentially eliminate the opportunity cost of holding required

\textsuperscript{10} The primary rate is also known as the "discount" rate. This is the interest rate charged by the Federal Reserve to depository institutions for primary credit loans from the discount window.
\textsuperscript{11} The interest rate charged by member banks to other banks, to borrow funds, usually overnight.
\textsuperscript{12} A member bank of the Federal Reserve must meet requirements for a Federal charter. This includes placing reserves in its the Regional Bank, but this gives the bank access to the discount window.
\textsuperscript{13} Required reserves are the amount of funds that depository institutions must hold in reserve against deposit liabilities. The Board of Governors controls the amount of cash to be held at the bank or deposited into one of the regional Reserve Banks. The Financial Services Regulatory Relief Act of 2006 set the original date for the Fed to offer interest payments on required reserves and excess reserves for October 1, 2011.
reserves, promoting efficiency in the banking sector" (Board 2008). The Board of Governors determines the rate paid on reserves.

4.2 Beyond the Discount Window—New Credit Facilities Unveiled

After BNP Paribas halted redemptions on its hedge funds, the wariness of lenders caused short-term interest rates to increase, making borrowing more difficult for financial institutions at a time when they needed to have funds available. With the continuing deterioration of conditions in securities markets, banks were becoming reluctant to lend to other banks, and they were stockpiling reserves against possible losses. Traditional methods for curbing market risk like cutting the discount rate and open market operations to meet reserve demands were not effective enough to ease market stress. In response, the Federal Reserve created several new monetary policy tools to help deliver funds to financial markets. Each facility differs by the institutions served, duration and cost of a loan, and acceptable collateral for the loan. However, all of the new tools were designed to deliver liquidity to struggling financial sectors in a way that does not affect the monetary base, thus creating inflationary pressures.

In response to declining market conditions, the Federal Reserve Board of Governors granted approval for the creation of the Term Auction Facility (TAF) on December 12, 2007. Traditionally, the Fed uses Open Market Operations (OMOs) to meet reserve needs and to target the federal funds rate. However, traditional reserve markets were not functioning and banks were having trouble obtaining the reserves they needed. Therefore, the TAF was created in hope that "[…] this facility could help ensure that liquidity provisions can be disseminated efficiently even when the unsecured interbank markets are under stress" (TAF 2009). The facility allows depository institutions to place a bid for an advance loan from its regional Federal Reserve Bank. The interest rate paid on these loans is determined by the auction; the terms of the loans are
either 24 or 84-days. One advantage of this facility is that it allows the Fed to inject funds into
the system against a broader range of collateral than OMOs, thus ensuring liquidity in an adverse
financial system. That is, traditional OMOs trade money for government bonds, but this facility
was not limited to government debt and could use money to purchase private sector assets. TAF
actions ultimately increase the monetary base because they involve cash for asset trading.
Therefore, the Fed used open market operations, selling Treasury Bills, to offset the difference.

The TAF auctions began on December 17, 2007 when the Fed offered $20 billion on a
28-day credit period (Board 2007). The auctions were scheduled to take place every two weeks.
The competing bidders on the funds determined interest rates on the loans. Originally, the
amount of each auction was $50 billion, but by September 29, 2008, the Fed increased the size to
$150 billion. In June of 2009, the size of the facility was reduced to $125 billion. Following two
more reductions in July and August, the Board shrank the facility to $75 billion per auction as
economic conditions improved. The final TAF auction was held on March 8th, 2010. The upward
and downward trend of the size of this facility relates to the severity of the crisis. The Board
adjusted the size of the auctions offered based upon current economic conditions. As markets
improved, the facility was systematically reduced and eventually closed.

The Fed’s next weapon, the Term Securities Lending Facility (TSLF), was introduced on
March 11, 2008 and the first auction was on the 27th of that month. The TSLF was a weekly loan
facility that was intended to promote liquidity in Treasury and other collateral markets. It
provided up to $200 billion of Treasury securities for 28-day terms against federal agency debt,
federal MBS, and other securities. In May of 2008, the Fed increased the list of eligible collateral
for a loan from the facility to include AAA and Aaa rated asset-backed securities. The TSLF
included all eligible assets for the TAF and expanded the range of acceptable assets for
collateral. Because the TSLF involved security for security trading, its use did not increase the monetary base, thereby causing inflationary pressures. Extending loans from the facility changed the composition of the Fed’s assets, but not the monetary base. The facility was closed on February 1, 2010.

The difference between the TSLF and the TAF was the TSLF offered credit to the FRBNY’s primary dealers rather than to depository institutions along with expanding acceptable assets for collateral. Primary dealers had the option to bid on weekly auctions of Treasury general collateral (such as T-bills, T-notes, and T-bonds) using a wide variety of assets including student loans, credit card debt, and MBS. The security-for-security exchange was intended to provide primary dealers with assets that were more appealing to other investors than currently held assets on a dealer’s balance sheet. The facility aimed to place easily traded securities into the hands of the primary dealers and used a wider array of acceptable collateral to obtain the loans. The dealers, therefore, could successfully trade the government issued securities to other investors in exchange for cash. The facility made tradable financial products available to money markets using less liquid assets as collateral.

The Primary Dealer Credit Facility (PDCF) was an overnight loan facility that provided funding for up to 120 days to primary dealers and accepts a wider range of collateral against loans than the TSLF does. PDCF activity began on March 17, 2008 and was concluded on February 1, 2009. This is a “cash for bond” lending facility; therefore, its activity could affect the amount of reserves in the system, and thus the monetary base. Again, the use of OMOs can offset this change.

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14 Primary dealers are banks and securities brokerages that deal directly with the FRBNY. These organizations take part in OMOs and other Treasury security lending. The peak number of primary dealers was 46 in 1988 and currently there are 18 eligible dealers.
The next step the Fed took was to create the September Facility. In a response to AIG’s liquidity crisis, the Board of Governors authorized the creation of this new lending facility through the FRBNY. They determined that based on the economic conditions at the time, the failure of AIG would magnify financial market instability. This would lead to higher borrowing costs due to increased risk in the overall market, reduced household and business wealth, further decline of asset value, and continued constriction of credit flow to households and businesses.

On September 16, 2008, the Board authorized the FRBNY to lend up to $85 billion to AIG and as of October 1, AIG had borrowed $62 billion. The secured loan was set up in the interest of taxpayers and the Federal Reserve. The facility was under a 24-month term and assets from all of AIG’s business were used as collateral. The loan was extended to help relieve pressure on AIG to pay back its debt obligations to counter parties when they became due. The new lending facility was to assist AIG with meeting obligations to creditors as they came due as well as adding support the company so that it could sell certain parts of its business without disrupting the overall economy.

The September Facility was set up in a way that protected the taxpayer and the Federal Reserve. Any lending from the facility was collateralized by all of the assets of AIG and its non-regulated subsidiaries. The assets included basically all of the equity of the company’s non-regulated subsidiaries and the terms of the agreement included a 79.9% equity interest in AIG along with veto power for decisions about dividend payment. Additionally, the Fed placed staff on site at AIG to take part in the day-to-day business and to ensure the progress of repayment. The provisions protected the interest of the Fed, the Treasury, and the taxpayer by ensuring all of the loans extended from the facility were paid back in full.
On September 19, 2008, in response to high demand of investors for redemption in money market mutual funds, the Fed announced the creation of the Asset-Backed Commercial Paper Money Market Mutual Fund Liquidity Facility. This temporary lending facility was intended to help the ABCP market run more smoothly by providing funds to primary dealers to purchase ABCP and then resell them. This enabled money market mutual funds to unload their asset-backed commercial paper (ABCP) more easily when the demand for redemptions from their investors increased. The increased demand for liquid assets from mutual fund investors placed a larger strain on the supply of those assets as many investors were scrambling for short-term investments. However, money market investors needed money, so the Fed created another credit facility “to lend to special purpose vehicles that could buy a wider range of money market mutual funds assets” (Mishkin 387). The Money Market Investor Funding Facility (MMIFF) enabled money market mutual funds to set up special purpose vehicles (SPVs) that could obtain secured loans from the FRBNY to purchase money market instruments in the secondary market from eligible investors. The SPVs (five total) could purchase assets by issuing either ABCP or by borrowing under the facility. The facility was announced on October 21, 2008 and was closed on October 30, 2009.

The loans to the SPVs were fully collateralized by other assets owned by each SPV to protect the FRBNY against losses. The maximum loan limit the facility could extend was $600 billion. The FRBNY was to finance up to 90% of the assets that were purchased, meaning that financing from the facility could reach up to $540 billion. Eligible assets for purchase under this
program include bank notes, deposit certificates (in USD), and commercial paper from institutions with high credit ratings.\textsuperscript{15}

Many financial intermediaries issue commercially backed paper to finance the credit needs of households and businesses. However, with the fall of Bear Stearns and Lehman Brothers, investors and money market mutual funds were not purchasing a sufficient volume of commercial paper in lieu of market conditions. The Federal Reserve Board announced on October 7, 2008 the creation of the Commercial Paper Funding Facility (CPFF). The FRBNY could extend a loan to a SPV that would purchase eligible three month ABCP. Once the paper matured, the SPV would use the proceeds to payback the loan from the Fed. The facility made funding available to the issuers, increased assurance to both investors and issuers that firms will be able roll over the maturing commercial paper, and contributed to smoother operation of the credit market in general.

The FRB announced the creation of the Term Asset-Backed Securities Loan Facility (TALF) on November 25, 2008 and the first auction was held from March 17-19 of 2009. This facility helped provide funding for market entities to meet the credit needs of households and businesses. They will do this by issuing asset-backed securities (ABS) using student loans, auto loans, credit card loans, and loans guaranteed by the Small Business Administration as collateral. Under the TALF, the FRBNY lends up to $200 billion on a non-recourse basis to holders of some AAA ABS backed by new consumer and business loans. The loans are always backed by the ABS, which can be sold to an SPV if the borrower does not repay the loan. Also, the US Treasury Department under Troubled Asset Relief Program (TARP) of the Economic

\textsuperscript{15} Institutions with high credit ratings from two of three nationally recognized statistical ratings organizations: S&P, Moody's, and Fitch.
Stabilization Act of 2008 will provide $20 billion of credit protection to the FRBNY to insure against losses from the TALF.

4.3 New Credit Facilities in Delaware

The Board of Governors determined that in addition to the September facility, more action was necessary for the survival of AIG. With the market conditions at the time, and with AIG’s current situation, there was expectation that many of AIG’s counter-parties would not renew their securities, and again AIG would face a liquidity crisis. The secured borrowing facility was to reduce the strain from the continued decrease of security selling to counter-parties. The facility can collateralize against existing security obligations under AIG’s insurance subsidiaries that could not be used as collateral by the FRBNY under the September Facility. These new facilities were to help stabilize AIG in the short term by enhancing liquidity. This will help maintain the value of all of AIG’s subsidiaries by giving the company time to sell certain parts of its operations in an orderly manner.

November 10, 2008, the FRB and the US Treasury Department announced the restructuring of the financial support to American Investment Group, Inc (AIG). The FRB authorized the FRBNY to lend up to $22.5 billion to Maiden Lane II LLC to purchase residential mortgage backed securities from several regulated US insurance subsidiaries under AIG. The extension of funding began on December 12, 2008. The proceeds from the insurance subsidiaries and from AIG’s funds will be used to pay off all security borrowers (including about $19.9 billion to the Fed). After the obligations are paid off, AIG will pay off its obligations to the Secured Borrowing Facility. AIG will not receive payments until the principal and interest owed to the Fed is completely paid off (maturity of six years). After all debts have been paid off, any
remaining returns will be split between the Fed (5/6) and AIG (1/6). Both LLCs are managed by a financial advisor hired by the Reserve Bank to help maximize repayment to the Fed.

On November 10, 2008, the FRB authorized the FRBNY to lend up to $30 billion to Maiden Lane III LLC to fund the purchase of multi-sector collateralized debt obligations (CDOs). AIGFP at the time had written collateralized debt securities (CDS) totaling about $37.3 billion. Declines in mark to market values caused AIG to post further collateral against these securities, further straining its liquidity. In response, this LLC was authorized by the FRB to purchase these obligations and repay the holders. The structure of the loan to the CDO LLC is similar to the RMBS LLC. Repayment of the debt to the Fed comes first, and then the leftovers are split between the Fed (2/3) and AIG (1/3).

4.4 Fiscal Policy Responses

The use of fiscal policy during a crisis has two main goals: to increase aggregate demand and to stabilize financial markets. The shock to the financial industry had its roots within the housing market, and with mounting losses, some type of intervention was necessary to stimulate growth. Actions taken during the crisis included bailouts, government spending on things like infrastructure, tax rebates, help for state and local governments, and security purchasing programs. Although the programs are short term, the focus was to provide temporary support so that the system can get back onto its feet. Creating temporary relief for states and businesses can act to stymie slowdown of growth in an economy. Policy efforts attempt to place money into the hands of economic agents in order to stimulate spending.

As more and more Americans went into delinquency on their mortgages, the aggregate economy began feeling the pressure. If people could not pay for their mortgage, then they probably could not pay for their credit card payments either, and the increasing tightening of
wallets was hurting business overall. In an effort to increase consumer spending, the Bush Administration introduced a $168 billion tax cut with the Economic Stimulus Act of 2008. The Act provided a minimum $300 tax rebate to workers and provided more flexible depreciation terms for eligible capital. However, Administration delayed taking action until February 2008, this was just a month before Bear Stearns filed for bankruptcy, and it's not clear it did much to stimulate consumption. The rebate was aimed at increasing disposable income, thus increasing aggregate demand. But most people chose to save the money or pay off current debt instead of spending. The intended multiplier effect from the stimulus was less than expected, and the rebate did not increase aggregate demand significantly.

On July 30, 2008, President Bush signed into law the Housing and Economic Recovery Act of 2008. This allows the Treasury to purchase GSE obligations. This was a commitment for the Fed to purchase $100 billion of debt issued by Fannie Mae and Freddie Mac and also $500 billion of MBSs guaranteed by these GSEs. The program was intended to increase liquidity in the GSEs and help increase investor confidence with the Federal Housing Administration. The program offered government insurance lenders that reduced the mortgages of at-risk borrowers to 90% of the current market value (HUD). However, the program seemed ineffective, as participation from lenders was low.

The Bush Administration unveiled the Troubled Asset Relief Program (TARP) under the Economic Stabilization Act of 2008 in September. The $700 billion bailout package was designated to purchase toxic assets and to inject liquidity into banks and other companies. The Treasury was authorized to purchase preferred stock from eligible banks through the Capital Purchase Program. The program purchased preferred stock so that the government would not have voting power in these private institutions. A pattern of bailouts emerged after the
introduction of the program. Although the TARP attempted to revitalize the financial sector, the program did not address thousands of homeowners whom were defaulting on their mortgages nor the increasing number of unemployed workers, and the program was never fully implemented due to difficulties in evaluating assets the government proposed to purchase.

President Obama signed the Recovery and Reinvestment Act of 2009 into law on February 17, 2009. Since the interest rate was effectively set at zero, a situation known as a liquidity trap, monetary policy was ineffective at stimulating growth. This act was passed in an attempt to use fiscal policy to stimulate spending by means such as providing funding aimed to improve the country’s infrastructure. The program was 40% tax cuts. On the spending side, it provided funding for many Federal programs as well as aid for unemployment benefits, nutritional education programs, and Medicare. The act was written to encourage job growth and included long term goals like domestic renewable energy and lowering the cost of college for students (Recovery.gov). A website is available that tracks the progress of the spending with the intention of transparency for the actions taken under the act using taxpayer dollars.

5. Assessment

This section assesses the government’s actions during the crisis.

5.1 Restructuring Financial Industry Regulation

The original bankers, metal smiths, realized they could capitalize on gold deposits in their vault by loaning the gold out when it was not in use and unlikely to be demanded by depositors. He or she earned a profit by charging interest on loans and the amount a smith could lend was only limited by withdrawal demands from the depositors.

Over time, this led to the development of modern banking. However, when the banks that emerged from this process were unregulated, they were quite unstable. There were many banking
crises during this unregulated period of banking as the experience of the late 1800s and early
1900s shows. As a result of this instability, which was a key factor in the Great Depression,
banks were heavily regulated under the Banking Acts of 1933 and 1935. These acts created
deposit insurance, and institutions such as the Securities Exchange Commission (SEC), and these
measures led to a very stable traditional banking system for the next 50 years, i.e. until the
emergence of the shadow banking system.

Just like the smith, modern players in the financial sector continually formulate new ways
to create and distribute profit earning financial assets. Profit drives the innovation that can
potentially increase efficiency. For this reason, financial innovation should not be discouraged.
However regulation must be used to ensure socially optimal behavior from the institutions
creating and distributing these tools.

Institutions in the shadow banking system do not have to abide by traditional bank
regulations. The shadow banks have no leverage limits, nor do they have capital requirements
against their liabilities. The managers of companies like Bear Stearns and Lehman therefore had
the ability to buy and sell financial products with no limit on their debt-to-asset ratio. In other
words, for each dollar of the firm’s own money, they could borrow an unlimited amount against
it.

Had these shadow banks been under the same umbrella as traditional banks, the amount
each firm leveraged its assets would have been cut in half. The leverage limit for traditional
banks is approximately 15 to 1, whereas Lehman and Bear Stearns were both operating with
leveraged assets of about 30 to 1. To illustrate the importance of reduced leverage, consider an
unregulated firm that owns an asset that is worth $10. Using that asset as collateral, the firm
could borrow $300 (based on 30 to 1 leveraged assets). If the price of the firm’s asset drops by,
say, 10%, then the firm must post an additional $20 in cash or assets to meet the credit obligation (it needs $30 to cover the loss, but only has $10 in reserve). Now consider the regulated firm. Since the limit to leverage is 15 to 1, the firm would be allowed to borrow up to $150 against its asset. With leverage restrictions, a 10% drop in the value of the assets under its control would mean the firm would need and additional $5 to meet its credit obligations (it needs $15, but already has $10), which is substantially less than with higher allowable leverage. This could mean the difference between surviving and bankruptcy. The firm can obtain more funds in the unregulated market, but at what cost? The recent crisis proved that when liquidity dries up for short term lending because of increased demand to meet debt obligations, the cost to society of high leverage outweighs the gains. Though the example does not show this directly, the larger the deleveraging that must occur, the larger the downfall in financial markets; So limits on leverage can attenuate the effects of a crisis if and when it occurs.

Additionally, firms with high credit ratings, like AIG, were not required to hold capital against their liabilities. If stricter capital requirements were enforced, the strain on short-term liquidity would not have been so severe. The firms would have more cash on hand to pay off their debts. More importantly, requiring the firm to use its own cash as collateral would internalize some of the risk of selling products like CDOs. An affect of placing more risk onto the financial intermediaries will be to increase the quality of products that they sell. If financial derivative dealers become more selective about the securities they trade with, then the originators of the derivative will have incentive to create a high quality product.

The effectiveness of complex financial transactions depends upon the quality of the financial product created. In the years preceding the crisis, the quality of the components that the securities derived value from seemed to matter less and less. The firms discussed in this paper
were increasingly leveraging their assets using products that were not transparent to other investors. Banks had built up their balance sheets leveraging unstable assets. The nature of securitized products made the task of determining the value of the derivative incredibly difficult.

When the system recoiled upon itself as the crisis began, the normally smooth operations of money markets felt a crippling shock. It was as if the market were a racecar that had a wrench (liquidity freeze) thrown into the engine. The causes of the crisis can be traced to lack of capital requirements, over-leveraging of assets, lack of transparency of financial products, over stimulation of the housing market by the government due to low interest rate policies of central banks, excess liquidity from the saving glut, and investor greed. In order to avoid such an event from occurring again, new regulations must be established to evoke behavior from the financial sector that maintains a social welfare-maximizing goal rather than continued focus upon personal profit seeking behavior from the institutions that manage our money.

Restructuring our current financial system must occur to prevent future financial market instability. Regulations that are needed include strict leverage limits, transparency measures, capital requirements, ratings agency reform, and bringing the shadow system under the same regulatory umbrella as traditional system. A combination of these regulations could make transaction costs more expensive and slow down growth, though less so if they are well constructed, but they will serve to protect the interest of society and maintain long-term growth goals.

Forcing lending institutions to hold more capital against their debt obligations and imposing stricter leverage limits will make these firms more accountable for their practices. Firms should be forced to post their own cash in reserve as collateral to protect their creditors in
the event of credit rating downgrade or devaluation of traded assets. Increasing accountability on both sides of the market will induce higher quality trading.

Another major problem that must be addressed is the transparency of assets. A more effective, politically independent credit rating agency must be formed that conducts regular stress tests of the financial market and assesses the risks of the market agents. Setting more rigorous credit rating guidelines again will increase the quality of lending.

In addition, transparency can also be enhanced by forcing assets through organized exchanges. As it stands, many complex transactions are conducted privately between parties and are difficult to track and assess. Forcing as many trades as possible onto organized exchanges helps to give market participants the information they need to make informed decisions.

5.2 The Governments New Set of Tools

The US government has not been as involved in the private sector since the Great Depression. The government developed new ways to insert money into the financial system, and it created ways to bailout banks across the nation. The new monetary policy tools were designed to deliver liquidity to the struggling money market in an effort to encourage inter-bank lending.

The main cause of the crisis was the evaporation of liquidity in certain sectors of financial markets, sectors that were difficult to aide with traditional tools, and the Fed needed to find a way to inject money into the system. The country was slipping into what some feared was the next Great Depression. Three of the biggest financial derivatives dealers were plunging into insolvency, and the failure of one of those firms rocked financial markets and investor confidence worldwide. President Bush’s tax cut did not increase aggregate demand nearly enough to shake the impression that our economy was in trouble. Additionally, monetary policy
was ineffective in stimulating growth because of the low primary interest rate causing a liquidity trap.

When the government allowed Lehman to fail, it exacerbated the already shaky securities markets. The price of securitized assets dropped drastically. The Fed had stepped in to save Bear Stearns, and to save its counterparties from losses. However, the Treasury decided that the failure of Lehman would not worsen market conditions too dramatically. But, days after the firm filed for bankruptcy, asset prices plunged and credit channels dried up (Krugman 178). The severe shock that Lehman’s failure sent across the economy is proof that some companies are too important to our financial system to allow failure.

Today, AIG’s obligations to both Maiden Lane II and Maiden Lane III are nearly paid off. AIGFP was really the only struggling subsidiary of the company. The Fed now enjoys the profitability of the rest of the insurance holding company. Saving Bear Stearns and AIG was a very involved and risky move by the government. Nationalizing a company raises the hairs on many people’s necks, but considering the alternative of complete financial market failure, the socially optimal move was government intervention in the private market.

The new credit facilities were effective in easing the stress of unsecured interbank lending during the crisis. However, the government was taking a large gamble by lending cheaply to banks. In particular, the TAF proved to lower the risk for interbank lending. Although the facilities revitalized the staggering money markets, they are a short-term fix. In a future crisis, the Fed will have this new and important tool on their belt to deliver funds to financial institutions in need banks become reluctant to trade with each other. However, although the TAF proved to be effective, it does have a negative side. The nature of the facility exposes taxpayers to risk. The Fed extends cash to eligible firms and requires assets as collateral and
plans to offset the change of the monetary base using OMOs. Fortunately, however, it appears that the risks were largely avoided.

At the onset of the crisis, a larger focus on stimulating jobs and saving homeowners instead of saving banks could have done a better job at mitigating the crisis. In addition, the TARP fund gave taxpayer money to the institutions that created this mess and while the bailouts were needed to save the financial system, there are ways to avoid giving large payouts to those responsible for the problem (e.g. nationalization), and this would have been preferred. Finally, the crisis might have been remedied sooner had President Bush been willing to implement a large, aggressive fiscal stimulus package (including government spending, not just tax cuts) to be used for mortgage forgiveness programs, infrastructure improvements, and job creation to stimulate aggregate demand the crisis.

6. Conclusion

This paper chronicles and analyzes the financial crisis beginning in 2007 and the subsequent recession in 2008. The cause of the crisis can be linked to the freezing of available liquidity in short term money markets. Government monetary policy responses to the crisis included the traditional remedy of lowering the interest rate, and new policies and institutions aimed at delivering funding to the institutions and markets in need of liquidity. The policies altered the composition of the Fed’s balance sheet, created government interest in many private companies through preferred stock purchases. On the fiscal policy side, the government also provided a tax rebate and large stimulus package.

Several factors over the last couple of decades directly and indirectly magnified the crisis. These factors include a housing bubble helped along by low interest rate policies from the Fed, the Asian savings glut, increased issuance of subprime mortgages based upon questionable
qualifications of buyers, and the increased securitization of assets leading to lack of transparency and other problems. The prospect of purchasing a house that would continue to increase in value at a low interest rate enticed many people to enter the housing market, and banks were issuing increasing numbers of subprime mortgages. The structure of the shadow banking system enabled these banks to operate with high levels of leverage and with little or no capital requirements. Investment firms had highly leveraged portfolios comprised of these types of assets. Thus, when default rates on subprime mortgages began increasing unexpectedly, financial intermediaries scrambled for available liquidity to cover their margin calls. The intense strain on the short-term money market caused liquidity to dry up, and the Fed's traditional methods to correct market problems were ineffective. This experience makes it evident that financial regulation for the shadow banking sector must be increased to reduce systemic risks in the future by setting leverage limits, setting capital requirements, implementing credit rating agency reform, and making financial products more transparent.

The government's decision to let Lehman fail was a mistake, but the goal was to make it clear to firms that there was no implicit government guarantee that would cover losses if they got into trouble. The problem here is known as moral hazard, and this is a key problem that must be addressed in the future. One solution is to break up the banks, though it is not at all clear that many small banks would be any safer. Another is to create a resolution authority to allow banks to undergo the equivalent of bankruptcy without endangering the rest of the system. This must be a key part of any reform of the financial system.

As for fiscal policy, two stimulus packages were introduced, the Economic Stabilization Act of 2008 and the Recovery and Reinvestment Act of 2009. The former was a Bush administration tax cut that had little effect on increasing aggregate wealth. President Obama
signed the other act into law in an attempt to create new jobs and spur economic activity. This policy should have been enacted earlier in the crisis, but it does appear to be at least moderately successful. However, finding ways to implement fiscal policy on a timelier basis, and to target fiscal policy measures better must be addressed in the future. Part of the problem is political, it’s difficult to get both sides to agree on the remedy, and increased reliance on automatic stabilizers in the future may be the best way around this problem.
Works cited


