The Response of the Federal Reserve to the Banking and Financial Crisis of 2007/2008*

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The financial market crisis moved U.S. central bank policy from a well-established routine of interest-rate targeting to a multi-pronged triage that wedded traditional policy tools with new initiatives aimed at reviving a moribund financial system. The triage was controversial as it entailed support that required discretion over supporting particular markets and firms. These changes in the operation of central bank policy have been especially jarring following a quarter-century of generally quiescent macroeconomic activity and policy. With the crisis increasingly moving into the rearview mirror, the timing, size, appropriateness and effectiveness of the measures taken by the Federal Reserve are the subject of much discussion, analysis, and controversy.

In this paper, first and foremost, we hope to present an account of the multitude of policy actions taken by the Fed, providing a readable narrative that brings together information that otherwise requires consulting a variety of sources. Second, we also present a framework for thinking about the central bank policy response that gives the reader a means of organizing their own understanding of the response. A key theme is that the traditional tools at the disposal of the Federal Reserve, and much of the structure of banking regulation such as deposit insurance, focused on banks as being at the center of the financial system. With the development of institutions such as Money Market Mutual Funds, and markets such as those for securitized assets and credit derivatives, those tools were not sufficient to deal with a wider variety of institutions and markets that have become central to the function – and dysfunction – of the banking and financial system. The innovations and exercises of "emergency" powers by the Fed came about in recognition of the limits of the traditional tools to respond to the greatest financial crisis in the United States since the 1930s.

The next section of the paper addresses some broader themes that provide context for analyzing the Fed's response during the crisis. The second section describes the evolution of the traditional policy tools during the turmoil. The third section presents a taxonomy for classifying the nontraditional policy initiatives and then describes the new initiatives using this taxonomy. Conclusions are offered in the final section.

I. Context

Putting aside the chicken and egg question of whether finance leads development or vice versa, there is near universal agreement that a well functioning financial system is part and parcel of a thriving, modern economy and that the financial system is an important conduit through which central bank policy influences prices and economic activity. Naturally, a well functioning financial system will evolve with the economy, and this has certainly been true in the United States. In 1950, depository institutions (banks for short) accounted for 60 percent of the assets held by the financial sector, by 2006 that share fell to 30 percent. To paraphrase the work of Shin (2009) and Adrian and Shin (2009), financial intermediation chains have grown much longer and many of the links in the chain are market-based, non-bank financial intermediaries that do not rely on deposits for their funding. Money market mutual funds (MMMFs) alone, for example, hold roughly $4 trillion, while total bank deposits are roughly $8 trillion. Rather than a single bank accepting deposits from households and making commercial loans to firms or mortgage loans to other households, the financial system has evolved so that a lending household might purchase shares in a money-market mutual fund that holds commercial paper issued by a bank that engages in a repurchase agreement with a securities firm that has a special purpose vehicle that issues asset-backed securities that funds a pool of residential mortgages. You get the picture.

No matter what the driving forces may be behind this increase in the layers of financial intermediation - ranging from a more efficient allocation of risk to regulatory arbitrage aimed at avoiding capital requirements - the many layers of intermediation create chains of inter-linkages that can make the entire system more vulnerable to shocks in any one market or at any single institution and dramatically complicate supervision and monitoring. It also significantly complicates the ability of a central bank and regulatory authorities to respond to a financial crisis. In a crisis, the classic admonition from Bagehot was for central banks to lend freely but at a high rate of interest to illiquid but not insolvent firms. Fair enough, but does this lending need to be extended to every firm in a long intermediation chain and how do you disentangle liquidity and solvency for some of these market-based intermediaries when price

discovery in the markets that would allow for the valuation of assets and liabilities may be significantly impaired and, in some cases, has essentially disappeared?

Suffice to say that, at least in the United States, the tools available to the Fed did not evolve along with the financial system. Open market operations and discount lending, in addition to affecting the overall level of interest rates, are also designed to impact bank reserves and thereby the larger economy via the bank lending channel. When banks are the largest players in the financial system, these tools can be sufficient for quelling a crisis, but they are unlikely to be sufficient in a financial system characterized by long intermediation chains with many market-based intermediaries.

The legacy of the 1934 Glass-Steagall Act that separated commercial banking from investment banking in the U.S. was to keep the traditional tools of the Fed focused narrowly on commercial banks and bank holding companies. Although the 1999 Gramm-Leach-Bliley Act repealed a number of the legal obstacles erected by Glass-Steagall, in practice it was codifying evolving practices that had been chipping away at those barriers for years. Few financial institutions that were not long-standing commercial bank holding companies, however, became "financial holding companies" that would permit access to the Fed's discount window (because they generally did not want to be regulated by the Fed and be subject to Basel capital requirements, in particular, the leverage ratio). Thus, the Fed had no tools in its traditional repertoire to provide liquidity during a crisis to large and increasingly important segments of the financial system, ranging from investment banks to money market mutual funds.

Consider the current crisis characterized by both a sharp fall in the market value of assets held by financial intermediaries coupled with uncertainty over which intermediaries are most affected by the drop in asset values. Funding dries up for all intermediaries due to lack of information on intermediaries' exposures to the troubled assets coupled with an increase in risk aversion. Long intermediation chains compound this effect, as firms are concerned not only about the balance sheet of their immediate counterparty, but the balance sheet of firms throughout the intermediation chain, that is the balance sheet of their counterparties' counterparty. It becomes extremely difficult to disentangle liquidity from solvency because the price-discovery process has broken down in many markets and because

counterparty balance sheets cannot be estimated with any degree of confidence. The financial system slams to a halt and with it economic activity.

Traditional central bank policy tools can flood the banking system with liquidity, but this liquidity may not spill over to the market-based intermediaries when the financial markets linking the various institutions may are not functioning Open market operations and discount window lending will increase bank reserves, but there is no guarantee that these bank reserves will revive bank lending, or much less the entire chain of intermediation. Bank deposits, protected by deposit insurance, may be slow to runoff, but this will not be the case for the funding used by market-based intermediaries. Thus, traditional policy tools can liquefy banks but have little direct effect on market-based intermediaries. Even for banks, but more so for market-based intermediaries, questions about asset quality and capital adequacy will remain.

In a crisis, financial firms need access to sufficient capital to instill confidence in counterparties in order to successfully intermediate and thereby keep the credit channel open to support economic activity. And this capital must be accessed in a timely matter. The U.S. experience during the turmoil indicates that speed is essential in preventing the unraveling of intermediation chains.

As this framework makes clear, the Fed's response to the banking and financial crisis must be understood first within the context of the limits to its traditional toolkit and then by the need to innovate to keep up with the changes in the financial system in recent decades. We begin by focusing on the traditional tools of central bank policy financial-crisis-response followed by a careful consideration of the new initiatives, what we label the nontraditional response.

II. Traditional Response

Textbook descriptions of central bank policy usually list three key tools: open market operations, discount lending, and reserve requirements, before going on to say that reserve requirements are a relatively blunt and rarely used tool.. As the financial market turmoil metastasized in August 2007, the Fed responded in what can certainly be described as a textbook or traditional manner with an emphasis on

the target federal funds rate (open market operations) and the primary credit rate (discount lending). By way of background, from June 2006 through August 2007, the target federal funds rate was 5.25 percent and the primary credit rate was 6.25 percent – the 100 basis point wedge between the two rates having been adopted at the time of the discount window overhaul in early 2003.

On August 10, 2007, three days after the August FOMC meeting and in a press release reminiscent of those following the October 1987 stock market crash and the September 2001 terrorist attacks, the Board announced that it would "provide reserves as necessary" to keep the fed funds rate close to its target and reminded market participants that "the discount window is available as a source of funding." One week later, the Board voted to reduce the primary credit rate by 50 basis points, halving the usual 100 basis point gap between the primary credit rate and the target federal funds rate.[1] At the September FOMC meeting both the target federal funds rate and the primary credit rate were reduced by 50 basis points, the largest reduction in rates since the November 2002 FOMC meeting.

Figure 1 depicts these changes and shows the subsequent reduction in these two rates over the next two years. From September 2007 through the end of the year, the FOMC reverted to standard operating easing procedure – reducing the target fed funds rate by 25 basis points at each meeting and the Board bringing down the discount rate in lock-step However, in an unscheduled conference call and at its regularly scheduled meeting, the FOMC reduced rates by a total of 125 basis points in January 2008. Rates were cut an additional 75 basis points at the March FOMC meeting. (Non-traditional steps to assist the merger of Bear Stearns and JP Morgan Chase in March will be discussed below). Following a 25 basis point reduction in April, rates were cut another 100 basis points in October and effectively another 100 basis points in December when the FOMC moved to a target federal funds range of 0 to 25 basis points.

Early in the crisis, open market and discount window operations were not large by historical standards. Figure 2 shows the open market operations necessary to accommodate the decrease in the target federal funds rate. Operations spiked at $24 billion and $38 billion on August 9th and 10th

[1] At the March 2008 FOMC meeting the spread was reduced to 25 basis points.

respectively, but for the remainder of the month fluctuated around $10 billion. Certainly, the early part of the crisis does not stand out in Figure 2. By comparison, operations averaged $56 billion in the six days following the attacks on September 11th 2001. Operations were also much larger later as the crisis intensified, on September 18th 2008, for example, , they totaled $105 billion.

This pattern of a gradual increase in the virulence of the crisis can be more clearly seen in Figure 3 that plots discount window borrowing at the primary credit rate. Given the huge demand for funds since September 2008, the onset of the crisis in August 2007 appears insignificant. However, at the time an increase in primary borrowing from essentially zero to almost $3 billion was noteworthy. Pressures emerged again at year-end 2007 with borrowing reaching almost $6 billion.

Although not typically discussed in descriptions of traditional central bank policy, the Federal Reserve Bank of New York lends Treasury securities overnight from its portfolio to promote smooth clearing in the Treasury markets.[2] During times of stress, this lending increases and is another tool that we classify as traditional. As can be seen in Figure 4, the onset of the crisis in August 2007 saw an increase in securities lending, but the increase was more modest than the end of quarter pressure in late June. Pressures were also seen at year-end 2007, but heightened in March through May and especially in September through November 2008.

The examination of the traditional tools of central bank policy indicates that those tools looked sufficient to handle the crisis through at least year-end 2007. These traditional tools were called upon much more heavily in 2008 and 2009 in conjunction with non-traditional policy measures to which we now turn our attention.

III. Nontraditional Response

By December 2007 it was evident that the traditional financial crisis playbook for central bank policy was not achieving the desired result. From December 2007 through March 2009 the Federal

[2] Term lending is discussed later in the paper. It should also be noted that beginning in July 2009 the FRBNY also lends direct obligations of housing-related government-sponsored enterprises and the Federal Home Loan Banks to facilitate clearing in the agency markets.

Reserve put in place 16 different facilities or programs to combat the crisis. Temporarily setting aside the question of the effectiveness of these initiatives, the list is impressive both in its length and breadth. Even describing, much less assessing, the initiatives is a daunting task that can get bogged down in a long list of easily confused and easily forgotten acronyms. Any attempt at analysis requires an organizing framework.

Bernanke (2009a) presents a framework that classified each nontraditional initiative into three descriptive categories: lending to financial institutions, providing liquidity to key credit markets, and purchasing longer-term securities.[3] However, for our purposes, an alternative, functional framework can shed more light on the means by which the nontraditional initiatives supported the banking and financial sector. In particular, the policy initiatives can all be thought of as supplementing the traditional central bank policy tools in as many as three dimensions: expanding the type of counterparty receiving support, broadening the collateral required to access the support, and lengthening the maturity of the support. As discussed earlier, the traditional tools of open market operations and discount lending are almost exclusively aimed at short-term support for the bank-based piece of the financial system. In particular, the direct effect of these traditional tools is felt on bank balance sheets via either short-term transactions involving Treasury securities or the lending of reserves against high quality collateral. Dealing with new counterparties will be critical to extending assistance to important markets and firms in the intermediation chain. Accepting a wider range of collateral allows the Fed to support the financial system that has evolved from simple bank-based lending. Finally, extending the maturity of the support provides important flexibility in countering a long-lived crisis.

Table 1 presents a chronological listing and some information for the nontraditional policies, including an assessment of the function(s) served by each. The list is remarkable in its length and in the size of some of the policy initiatives. The list demonstrates the determination on the part of the Federal Reserve to contain the crisis – "whatever it takes" in the words of Chairman Bernanke. The Fed was

[3] This framework has proven quite popular, for example the Federal Reserve Bank of Cleveland has a series of charts on the three categories (http://www.clevelandfed.org/research/data/credit_easing/index.cfm). Cecchettil and Disyatat (2009) present a framework based on liquidity.

bound and determined to learn the lessons of history – lessons taught both by the U.S. experience during the Great Depression and by the Japanese experience in the 1990s. Three of the five members of the Fed Board at this time (Bernanke, Kroszner, and Mishkin) had done research on the 1930s and financial crises around the globe. Bernanke (2000) lays out these lessons quite clearly

> But Roosevelt's specific policy actions were, I think, less important than his willingness to be aggressive and experiment – in short, to do whatever it took to get the country moving again. Many of his policies did not work as intended, but in the end FDR deserves great credit for having the courage to abandon failed paradigms and to do what was needed to be done. … Japanese monetary policy seems to be suffering from a self-induced paralysis. Most striking is the apparent unwillingness of the monetary authorities to experiment, to try anything that isn't absolutely guaranteed to work. Perhaps its time for some Rooseveltian resolve in Japan.

In the remainder of this section we will provide a short description of the nontraditional initiatives, commenting where possible on the success of each program.

In an effort to remove the stigma associated with discount window borrowing and to allow depository institutions access to longer-term federal funds, the Term Auction Facility (TAF) was put in place in December 2007.[4] Rather than the mainly overnight borrowing of funds available at the discount window, the TAF initially made 28-day funds available, with the term increasing to as long as 84 days in August 2008. Figure 5 shows the allocations for each of the auctions as well as the amount of the bids submitted. As can be seen, the Fed gradually increased the size of the allocations, despite bid-to-cover ratios that averaged 1.7 during the first nine months of operations. Allocations doubled in October 2008 at the peak of the crisis and since then bids have never exhausted the allocation. Outstanding borrowing under the TAF peaked at almost $500 billion in March, 2009. Most recently, the allocation was reduced slightly to $125 billion with allocations to be gradually reduced as financial conditions improve. The TAF was designed to mimic the tenders conducted by the European Central Bank and the TAF and provides a useful tool, in both crisis and more normal periods, to smooth out fluctuations in the fed funds rate.

[4] The replacement of discount window adjustment credit with primary credit in 2003 was not enough to completely remove the perceived stigma associated with access to the discount window by institutions judged to be "sound."

At the same time as the TAF was established, the Fed also opened up reciprocal currency arrangements, swap lines, with other central banks. Financial institutions abroad had very strong demand for dollars during the crisis. Large demand by European banks, for example, would often send the federal funds rate up sharply in the mornings before the markets would close in Europe. After the close in Europe, the federal funds rate would then often fall sharply, thus introducing volatility and complicating the task of the desk at the NY Fed to maintain the target rate. We classify these swap lines as non-traditional in that they are not typically one of the tools used to implement central bank policy; however, they have a long history dating back to 1962.[5] The upper half of Table 2 provides data on the introduction and limits for the swap lines, while the bottom half shows the outstanding balances for each line at quarterly intervals. All told, swap lines have been established with 14 different central banks during the crisis.

Under the swap, the Fed provides dollars to the foreign central bank, while at the same time, the foreign central bank provides the equivalent amount of funds in its currency to the Fed, based on the market exchange rate at the time of the transaction. The exchange of funds is reversed in as little as one day or as long as three months, using the same exchange rate as in the initial transaction. Under these most recent arrangements, the Fed agrees to hold foreign exchange over the term of the swaps in special accounts at the foreign central banks. The System will earn no interest on these accounts and has agreed not to withdraw foreign currencies from these accounts. Foreign central banks will only draw dollars through the swap lines as they need them. They will use these dollars to provide liquidity to their banking markets. The foreign central banks guarantee full repayment of any drawing, and any interest earnings from lending these dollars revert to the System. The asymmetric interest payments act as a penalty rate for the foreign central bank, providing some incentive to discontinue the lines as financial markets improve.

[5] See Bordo, Humpage and Schwartz (2009) for details. Most notably, swap lines were used to support the Canadian dollar in 1962 and pound sterling in 1967. Under NAFTA, the Fed maintains two ongoing swap lines with Canada and Mexico.

In December 2007, lines were established with the ECB and the Swiss National Bank. As the crisis peaked in September and October 2008, lines were established with additional central banks and the sizes of the lines were increased. Total drawings under the lines peaked in December 2008 and have declined since then, now standing at less than $100 billion. In terms of our taxonomy, the swaps expand the counterparties to which the Fed can provide assistance via the foreign central banks.

Just prior to the December 2007 policy innovations, market anxiety had breached the levels seen in September 2007. The LIBOR/OIS spread rose to more than 100 basis points in late November. Following the implementation of TAF and the swap lines, this spread dropped relatively quickly, returning to a modest 20 basis points in January 2008. By this measure, the TAF and swap lines would be judged an initial success at relieving pressure in the inter-bank funding market. However, by March 2008 the spread had returned to 65 basis points on concerns over the viability of Bear Stearns.

At this point in time, newer measures were needed to relieve pressures on non-depository institutions without access to either the discount window or the TAF. The ghost of Glass-Steagall haunted the halls of the Fed because the Fed did not have traditional tools to provide liquidity to key institutions facing liquidity crises whose demise could have profound effects on the financial system. Moving quickly during the turmoil associated with the demise of Bear Stearns, the Fed introduced the Term Securities Lending Facility (TSLF), the Primary Dealer Credit Facility (PDCF) and provided assistance to facilitate the merger of Bear Stearns with JPMorgan Chase, assistance channeled through the Maiden Lane limited liability corporation.

In the week prior to the merger of Bear Stearn, the Term Securities Lending Facility (TSLF) was put in place to lengthen the term over which Treasury securities could be borrowed by primary dealers from the System Open Market Account (SOMA). The usual overnight lending of Treasuries, discussed above, reached $20 billion in late February 2008, signaling a clear appetite for a risk-free asset. In an attempt to relieve additional pressure in the Treasury markets, the maturity on lending was extended to 28 days in a series of weekly, rather than daily, auctions. Roughly every other week, auctions are held for Schedule 1 collateral followed the next week with an auction with Schedule 2 collateral. Schedule 1

collateral includes Treasury securities, agency securities, and agency mortgage-backed securities. Schedule 2 collateral adds highly rated private securities to the list of eligible collateral. Allocations and bids for the two different auctions are shown in Figures 6 and 7. The Schedule 1 auctions have had a fixed allocation of $25 billion since inception, despite the fact that bids roughly doubled allocations in July through October 2008. Schedule 2 auctions have higher and more variable allocations. Most recently, the Schedule 2 allocations were returned to $75 billion in April 2009 although bidding has been modest and declining. The last seven Schedule 1 auctions have generated no bids, while the last four Schedule 2 auctions have seen bids totaling less than 10 percent of allocations. Schedule 1 auctions were suspended effective July 1, 2009 with Schedule 2 auctions authorized through February 1, 2010. To the extent that it is competitive, the bidding inherent in the auction structure ensures that the Fed earns a fair return and also ensures, as recent auctions indicate, that the facility will wind down with improved conditions.

The troubles at Bear Stearns made the Fed acutely aware of the constraints that it faced in being able to follow the traditional policy of lending in a crisis – because the traditional tools would not be able to provide liquidity directly to crucial financial institutions that were not bank holding companies. The inter-linkages of market-based intermediaries raised concerns about the consequences for counterparties of the failure of an institution such as Bear Stearns, hence for the stability of the financial system as a whole. In these circumstances, the Fed Board exercised the emergency powers granted to it in the 1930s (so-called section 13(3) powers) to act in "unusual and exigent circumstances" to stabilize the situation at Bear Stearns and to create a facility that would allow a widening of access to Fed liquidity. The Primary Dealer Credit Facility (PDCF) was established to give primary dealers (mostly non-depository institutions) access to overnight federal funds – effectively discount window access. These dealers pay the same primary credit rate that depository institutions are charged. As can be seen in Figure 8, borrowings quickly reached almost $40 billion in early April 2008 but fell off quite rapidly as market conditions improved. In July and August 2008 the PDCF was almost completely inactive. Lending soared with the September and October 2008 market turmoil, reaching almost $150 billion. While TSLF allocations did

not adjust in September and October, the PDCF accommodated additional demand. Obviously, the two facilities did not prevent the re-emergence of financial stress during September and October, but it is likely that the strains would have been much greater without these facilities, in particular the PDCF.

The assistance to facilitate the merger of Bear Stearns with JP Morgan Chase in March 2008 became the first of the Fed's initiatives aimed at particular financial institutions. As the merger was finalized in June 2008, the FRBNY extended a $28.8 billion dollar ten-year loan to Maiden Lane to control $30 billion in former Bear Stearns assets. The floating interest rate on the loan is the primary credit rate which stood at 2.25 percent in June, 2008 but now stands at 0.5 percent. A bit less than half of the assets held by Maiden Lane consist of agency collateralized mortgage obligations. Fair values for the Maiden Lane assets are reported periodically Table 3 contains information on the Maiden Lane portfolio, as well as the portfolios of Maiden Lane II and Maiden Lane III (to be discussed below)

The policy measures put in place in early March 2008 generated an enormous amount of controversy (see Volcker (2008)). The Fed crossed the Rubicon in a dramatic expansion of counterparties and in facilitating the resolution of Bear Stearns. The broadening of collateral and expansion of counterparties undertaken in early March 2008 were unprecedented. Some of the controversy caused by these action was a factor motivating the creation of the Troubled Assets Relief Program (TARP) contained in the Emergency Economic Stabilization Act (EESA) passed in October 2008 (see Swagel (2009) for an excellent and detailed analysis of the EESA)

Markets remained under heightened stress for roughly 10 weeks beginning in March 2008. Conditions eased slightly and were much less volatile from the middle of May 2008 through early September and this period saw only one additional initiative on the part of the Fed – the introduction of options on the TSLF (TOP). These options were designed to help relieve quarter-end pressures when firms might feel heightened need for risk-free assets and all the options required Schedule 2 collateral. Through 2008, auctions were heavily subscribed with bid to cover ratios average 1.75. The two auctions conducted in 2009 generated much less interest and the program has been suspended. A total of 6

auctions were held and the TOP program. These options programs bore some resemblance to a program that the Fed created to accommodate the strong liquidity demand that occurred during Y2K.

The conservatorship of Fannie Mae (FNMA) and Freddie Mac (FHLMC) set in motion the most virulent phase of the financial crisis – September through December 2008. In second week of September, investment banks and many commercial banks were facing extraordinary funding pressures. The funding horizons had been shortening so that an enormous amount of paper had to be rolled overnight or over very short horizons. In many cases, these institutions were having much difficulty obtaining funding even at these short horizons and even in fully secured overnight borrowing markets, the repo markets. In addition, a number of market participants were pulling away from institutions where there were rumors or concerns about solvency – not only as counterparties but as clients. This implosion of their business model stemming from uncertainty about how different parties would be treated in bankruptcy (see Kroszner (2009)) only made market participants more concerned about their viability.

In one momentous weekend in mid-September, 2008, the ghost of Glass-Steagall was truly vanquished. In a transformation that in normal circumstances might have taken years, large independent investment banks disappeared. Morgan Stanley and Goldman Sachs requested and received permission on an emergency expedited basis to become commercial bank holding companies regulated by the Fed. Bank of America purchased Merrill Lynch. Lehman, which had been struggling to survive for months prior to the conservatorship of Freddie and Fannie, could not find a merger partner and succumb.

One of the world's largest insurance companies AIG (but also a thrift holding company because it owns a Savings & Loan) faced credit ratings downgrades and large requirements to post collateral due to enormous exposure in the credit derivatives markets (particularly credit default swaps) taken on by its AIG Financial Products subsidiary. To avoid collapse of AIG, which would not only raised the possibility of significant market disruption to other intermediaries through counterparty inter-linkages but also to the underlying insurance operating companies that may have been forced into receivership by state insurance regulators, on September 16th the Fed Board authorized the FRBNY to provide up to $85 billion secured lending for up to two years to AIG at a rate of 850 basis points above three-month LIBOR, an

offer that was immediately taken up.[6] This was the first of a number of actions to stabilize AIG. The second, announced in October, 2008, provided an additional $37.8 billion in liquidity to AIG via FRBNY borrowings of securities from AIG backed by cash collateral posted by the FRBNY. On November 10, 2008, Fed assistance to AIG was restructured. AIG used TARP funds to reduce the balance on the $85 billion loan to $60 billion. In addition, the FRBNY extended credit to the newly created Maiden Lane II and Maiden Lane III corporations that respectively purchased $22.5 billion in residential mortgage-backed securities and $30.0 billion in collateralized debt obligations from AIG. The Maiden Lane II facility replaced the October $37.8 billion facility. Both the Maiden Lane II and Maiden Lane III loans have a term of six years with an interest rate 100 basis points above one-month LIBOR.

Another key non-bank began to experience extraordinary liquidity pressure, namely money market mutual funds (MMMFs, also called 2a-7 funds). As noted above, MMMFs hold roughly half as much as banks do in deposits and the MMMFs were key funding sources for short term bank paper and repo agreements. MMMF shareholders had traditionally treated MMMFs as near-perfect substitutes for deposits because they had consistently been able to maintain the value of each share at $1. That began to change in this period as shareholders became concerned about the value and liquidity of their investments and began to withdraw their money, as can be seen in Figure 9.

The net asset value of the Primary Fund, one of the funds in the historically important Reserve Funds complex, fell below $1.00 per share on September 16, 2008 – the first time such a major money market mutual fund had "broken the buck." This significantly exacerbated the run that had begun on MMMFs: the Investment Company Institute redemptions totaled $300 billion the week of September 15th. In turn, the MMMFs rushed for the liquidity and safety of Treasury securities and shunned their long-standing role as funders of the banking system. The run on the MMMFs thus led to a "funding run" on the banks, since the banks suddenly lost much of this significant source of financing. To stanch these runs, on September 19th, the Treasury provided a temporary guarantee of $1 per share for MMMF accounts and funds began to flow back into these accounts. Importantly, the guarantee was only for the

[6] On November 10, 2008 the rate was reduced to 300 basis points above LIBOR.

amount in a MMMF account as of the date of the announcement of the program. If a full guarantee covered even for future inflows, that could have precipitated a liquidity drain, or even a run, on bank deposits, which at the time were guaranteed up to only $100,000. Soon after, the FDIC was authorized to increase deposit insurance to $250,000 and provide unlimited guarantees for non-interest-bearing transactions accounts that are typically used by businesses.

The Fed also announced a significant new program on September 19 to try to restore the ability of banks to obtain short-term secured financing. The Asset-Backed Commercial Paper Money Market Mutual Fund Liquidity Facility (AMLF) extends non-recourse loans at the primary credit rate to U.S. depository institutions and bank holding companies to finance purchases of asset-backed commercial paper (ABCP) from money market mutual funds at amortized cost rather than market prices. Loans under AMLF can be used to purchase ABCP with maturities up to 120 days for depository institutions or 270 days for bank holding companies. The cash raised by the funds from selling the ABCP then allows the MMMFs to honor their redemptions and, thus, increase the willingness of MMMFs to return to their role of providing short term secured funding to the banking system. The AMLF was accessed immediately, see Figure 10, reaching $152 billion on October 1, 2008.

With the turmoil in the financial markets reaching a fever pitch, on September 20th, the Treasury department, with the support of the Federal Reserve, submitted legislation to Congress to request $700 billion for a Troubled Asset Relief Program (TARP) (see Swagel (2009) for a comprehensive discussion of the program and the politics). In the following week, major financial institutions were either failing or facing significant funding and liquidity pressures. Evidence of these strains can be seen in Figure 11 that shows one measure of bank fragility, the LIBOR-OIS spread, which was reaching extraordinary levels. On September 25th, Washington Mutual (WaMu), a thrift holding company, failed and was acquired by JP Morgan Chase. Wachovia was also on the brink of failure and on September 29th reached an agreement in principle to be acquired by Citigroup with FDIC assistance. Roughly a week later, Wells Fargo agrees to acquire Wachovia without FDIC assistance and so wins the bidding. On the same day, October 3, the

Emergency Economic Stabilization Act of 2008 (EESA) is passed by Congress. As Figure 11 shows, soon after the passage of the EESA, the LIBOR-OIS spread begins to come down.

During early October, the Federal Reserve continued to work on relieving the stress and strains in the commercial paper market and on October 7 announced the establishment of the Commercial Paper Funding Facility (CPFF). As can be seen in Figure 12, asset-backed commercial paper issuance had been falling steadily since the summer of 2007. In September and early October, 2008 financial firm issuance fell precipitously as risk appetites waned. Spreads on commercial paper jumped, most notably for the riskier A2/P2 variant shown in Figure 13. The CPFF is a special purpose vehicle funded by a FRBNY loan and supported by the U.S. Treasury that makes direct purchases of three-month unsecured and asset-backed commercial paper. The commercial paper purchased through the CPFF is discounted using a rate equal to the three-month overnight index swap (OIS) rate plus a spread. The spread for unsecured commercial paper is 100 basis points and the spread for ABCP is 300 basis points. Unsecured commercial paper issues also pay a 100 basis points surcharge. The spreads were chosen to discourage use of the CPFF as market conditions stabilize.

The first purchases under the CPFF were made in late October and the facility held $300 billion in commercial paper by early December, seen in Figure 14. Holdings of the CPFF have gradually run-off since January 2009 and now stand at around $100 billion. The effectiveness of the CPFF can be assessed by looking at both commercial paper outstanding as well as commercial paper interest rates. By the former measure, the CPFF can be judged to have slowed the decline in issuance while by the latter it has relieved pressures in the commercial paper by sharply reducing A2/P2 rates. As of the end of March of this year, the CPFF showed a positive return of $2.7 billion.

In an effort to further support money market mutual funds, the Money Market Investor Funding Facility was also established in October 2008. The MMIFF was designed to complement both the AMLF and CPFF by providing funding to private special purpose vehicles created to purchase certificates of deposit, bank notes and financial commercial paper with maturities of less than 90 days from money market mutual funds. Thus, the AMLF financed purchases of asset-backed commercial paper from

money market mutual funds by banks and bank holding companies, the CPFF supported the purchase of commercial paper from any seller, not just money market mutual funds, and the MMIFF was designed to broaden the class of assets to be purchased from money market mutual funds. Originally, the FRBNY was given authorization to lend as much as $540 billion to the special purpose vehicles under the MMIFF. However, the pressures on money market funds eased in late October and November and the FRBNY has yet to extend any loans under the MMIFF.

Effective October 9, 2008, as authorized by the EESA, the Fed began to pay interest on banks' required and excess reserve balances. Initially, banks earned 75 basis points less than the target federal funds rate on excess reserves, two weeks later the 75 basis point differential was narrowed to 35 basis points, and two weeks later in early November the differential was eliminated. At the December FOMC meeting, the rate on excess reserves was set at 0.25 percent where it has since remained.

There can be no doubt that the paying of interest on excess reserves, by itself, is a tightening of monetary policy. As such, paying interest on excess reserves clearly moved in the opposite direction of the other expansionary policies put in place by the Fed. However, this move does not appear to have been all that quantitatively important. First, the decline in the money multiplier, explained in part by the paying of interest on excess reserves, did not completely offset the increase in the monetary base brought about by the other nontraditional policies. On balance, from July to December, M1 increased 13.2 percent.[7] Second, it is far from clear how responsive bank holdings of excess reserves were to the relatively low rate paid on excess reserves. Of course opportunity costs matter, but it is not immediately obvious that bank reserve behavior was completely determined by the interest rate paid on those reserves.

The initiatives put in place in September and October 2008, by themselves, would result in a large and rapid increase in the monetary base. Such an increase was viewed as unwelcome by the Fed, with Fed officials preferring to address the crisis by changing the composition of assets held by the Fed while leaving the size of those assets roughly unchanged, a policy dubbed "credit-easing" by Bernanke (2009a). Under "credit-easing" the Fed was selling short-term Treasuries and accumulating assets, mainly loans,

[7] Over this same period, M2 increased 5.5 percent.

under the new initiatives (AMLF, CPFF, AIG etc.) At some point, as the new initiatives grew in size, the Fed would either run out of Treasuries to sell and thereby limit the new initiatives or allow the monetary base, in particular bank reserves, to increase with the increase in the initiatives. To forestall this possibility, on September 17, 2008 the Treasury announced, at the request of the Fed, a supplementary financing program under which proceeds from the sale of newly issued Treasury bills would be deposited at the Fed in a special account. The asset side of the Fed balance sheet would start to bulge as lending under the new initiatives increased without an offsetting sale of Treasuries, but the liability side of the balance sheet would also increase with the new Treasury deposits. This would leave the monetary base unchanged. Put another way, the Treasury sale of supplemental Treasury bills drains bank reserves even as the lending under the new initiatives adds to bank reserves. The Treasury supplemental financing account at the Fed peaked at over $550 billion in late October, 2008 before falling off rapidly to roughly $200 billion in mid-January 2009.

On October 14, two key initiatives supporting the banking sector were announced. First, the Treasury would use TARP funds to inject capital into financial institutions through the purchase of preferred stock and warrants. Nine of the largest banks announce that they will accept $125 billion of government capital under this program. Second, the FDIC would guarantee the senior debt obligations of FDIC-insured depositories and their holding companies under the Temporary Liquidity Guarantee Program (TLGP). Table 4 provides some information on the FDIC loan guarantee while Table 5 presents information on the TARP allocations for 17 of the largest financial institutions.

Late November 2008 also saw a flurry of new initiatives. First, the Fed joined Treasury and the Federal Deposit Insurance Corporation (FDIC) in providing a package of support to Citigroup, in particular guaranteeing $306 billion in Citigroup assets backed by residential and commercial real estate. The Fed agreed to provide a non-recourse loan to Citigroup in the event that losses on the asset pool amount to more than $46 billion, with losses above this amount split 90/10 between the Fed and Citigroup. The loan would carry an interest rate of 300 basis points above the Overnight Index Swap (OIS) rate.

This guarantee is in place for 10 years for residential assets and 5 years for non-residential assets. To date, no Fed lending has been provided to Citigroup.

Two programs were announced on November 25, 2008. The Term Asset-Backed Securities Loan Facility (TALF) is a joint operation of the Fed and Treasury. Again exercising its 13(3) powers to lend to individual, partnerships, and corporations in "unusual and exigent" circumstances, the Fed Board authorized the NYFRB to provide non-recourse loans to owners of newly issued and highly rated asset back securities (ABS). TARP funds would be used to capitalize a special purpose vehicle (SPV) that would purchase and manage any assets received by the NYFRB in connection with the TALF loans. By putting the Treasury in the first loss position through its purchase of subordinated debt in the SPV, the structure of the TALF then permitted the Fed to be able to accept a wider variety of collateral and hence provide direct liquidity support to a wider variety of securitized credit markets. tiohen has a greater ability to lend against a wider variety of collateral.

As the TALF was originally constructed, the FRBNY would lend on a non-recourse basis to owners of newly issued, AAA-rated, asset backed securities (ABS) collateralized by student loans, auto loans, credit card loans, and loans guaranteed by the Small Business Administration. This lending was meant to revive the securitized credit markets serving households and small businesses. Initially, the Treasury provided $20 billion in TARP funds for loss protection to the FRBNY and the TALF was limited to $200 billion. In February 2009, the TALF was expanded to include newly issued ABS collateralized by commercial and residential mortgage-backed securities. At the same time, the limit on the TALF was increased to $1 trillion with the Treasury TARP loss protection increasing to $100 billion. In May 2009, CMBS issued before January 1, 2009 (legacy CMBS) were add to the list of eligible collateral for the TALF. The rates charged on the TALF loans vary by collateral, ranging from 50 basis points over one-month LIBOR to 100 basis points over the five-year LIBOR swap rate. Loan amounts are determined by haircuts that vary across sector and maturity ranging from a low of 5 percent applied to prime credit card assets with a maturity of less than one year to 16 percent for auto rentals with a maturity

between four and five years. Here again, this rate and haircut structure should discourage TALF issuance was market conditions normalize.

The TALF was designed to offer liquidity and reduce uncertainty during times of stress, but it has been slow to catch on as markets have stabilized The first lending under TALF did not take place until late March 2009 and TALF lending currently stands at only $30 billion (Figure 15). This lending has supported roughly half of all the ABS issues since the crisis. In some sense, the program is a victim of its own success. Spreads on ABS issuances have some down significantly since the TALF and its extension have been announced. Prices for CMBS securities moved up, for example, upon announcement that the program was expanded to include that class of securities. New ABS issuance, however, is still down significantly from its peak in early 2007. For perspective, in the first two quarters of 2007, net borrowing by ABS issuers averaged more than $600 billion at an annual rate.

On the same day that the TALF was announced, the Fed also announced plans to purchase direct obligations of housing-related government sponsored enterprises[8] (GSEs) as well as mortgage-backed securities guaranteed by Fannie Mae, Freddie Mac, and Ginnie Mae. Upon announcement of the program, their costs of funding dropped noticeably. Initially, purchases were capped at $100 billion for the direct obligations and $500 billion for the mortgage-backed securities. Purchases commenced in early December 2008 for the direct obligations and early January 2009 for the guaranteed mortgage backed securities. At the March 2009 FOMC meeting the caps were increased to $1.25 trillion for mortgage-backed securities and $200 billion for the direct obligations. To date, more than $600 billion in mortgage-backed securities have been purchased and more than $100 billion in direct obligations, as can be seen in Figure 16. These purchases were designed to "reduce the cost and increase the availability of credit for the purchase of houses, which in turn should support housing markets and foster improved conditions in financial markets more generally." With regard to cost, the spread of 30-year conventional mortgages over 30-year Treasuries has fallen from almost 250 basis points in late November, 2008 to a

[8] Federal National Mortgage Association (Fannie Mae), Federal Home Loan Mortgage Corporation (Freddie Mac), and the Federal Home Loan Banks

current spread of roughly 75 basis points. Availability is harder to judge, given data lags, but appears to be mixed. In the first quarter of 2009, net borrowing via agency and GSE-backed securities fell while net borrowing via mortgages increased.

In January 2009, the Fed joined Treasury and the Federal Deposit Insurance Corporation (FDIC) in providing a package of support to Bank of America that is quite similar in structure to the support provided to Citigroup. The Fed's non-recourse loan guarantees the return on a pool of $118 billion in Bank of America assets backed by residential and commercial real estate. Fed lending would be tapped in the event that losses on the asset pool amounted to more than $18 billion, with losses above this amount split 90/10 between the Fed and Bank of America. To date, no Fed lending has been provided to Bank of America.

The last nontraditional policy measure to be introduced is the purchase of longer-term Treasury issues "to help improve conditions in private credit markets." This announcement was made at the conclusion of the March 2009 FOMC meeting and a cap of $300 billion was placed on longer-term Treasury purchases. At the August 2009 FOMC meeting it was announced that the full $300 billion is to be purchased by the end of October 2009. As of this writing, roughly $260 billion in longer-term Treasuries have been purchased (Figure 16). The bulk of these purchases, about 85 percent, have involved maturities between 2 and 10 years, with most of the balance in maturities greater than 10 years. On the March 18, 2009 announcement, the yield on the 10-year Treasury fell almost 50 basis points but since then has risen, on balance, more than 120 basis points. Obviously, movements in Treasury yields give little indication of the program's success or failure considering all the other determinants of Treasury yields, in particular, the evolution of the government's fiscal situation. Eeven after these purchases are completed, the amount of Treasuries on the Fed's balance sheet will be roughly the same ($800 billion) as in early August 2007. Of course the maturity of these Treasury securities will have lengthened significantly, In early August 2007 only 20 percent of the Treasuries had a maturity of greater than 5 years, now that figure stands at 45 percent.

IV. Concluding Thoughts

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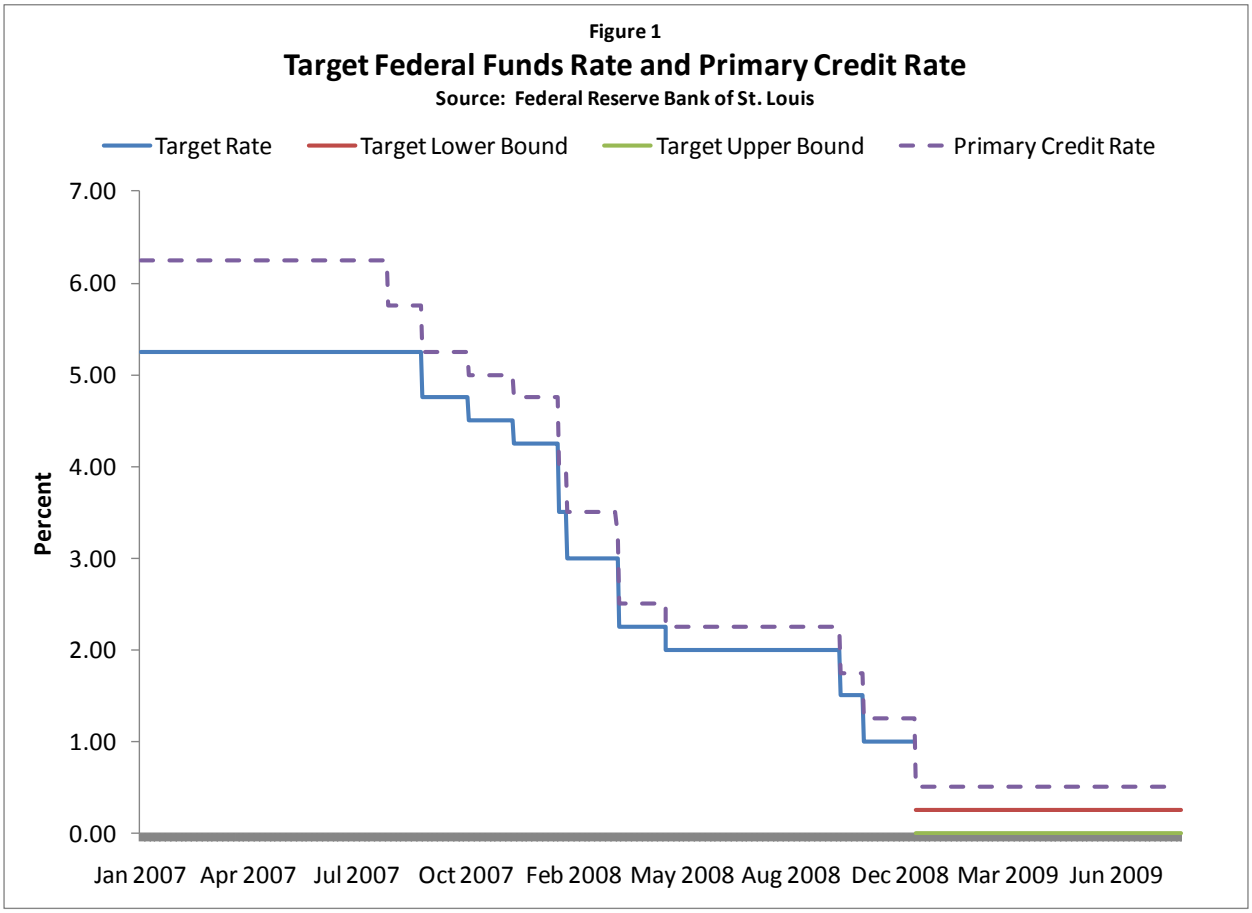


Figure 1
Target Federal Funds Rate and Primary Credit Rate
Source: Federal Reserve Bank of St. Louis
Target Rate
Target Lower Bound
Target Upper Bound
Primary Credit Rate
Percent
7.00
6.00
5.00
4.00
3.00
2.00
1.00
0.00
Jan 2007
Apr 2007
Jul 2007
Oct 2007
Feb 2008
May 2008
Aug 2008
Dec 2008
Mar 2009
Jun 2009

Figure 2

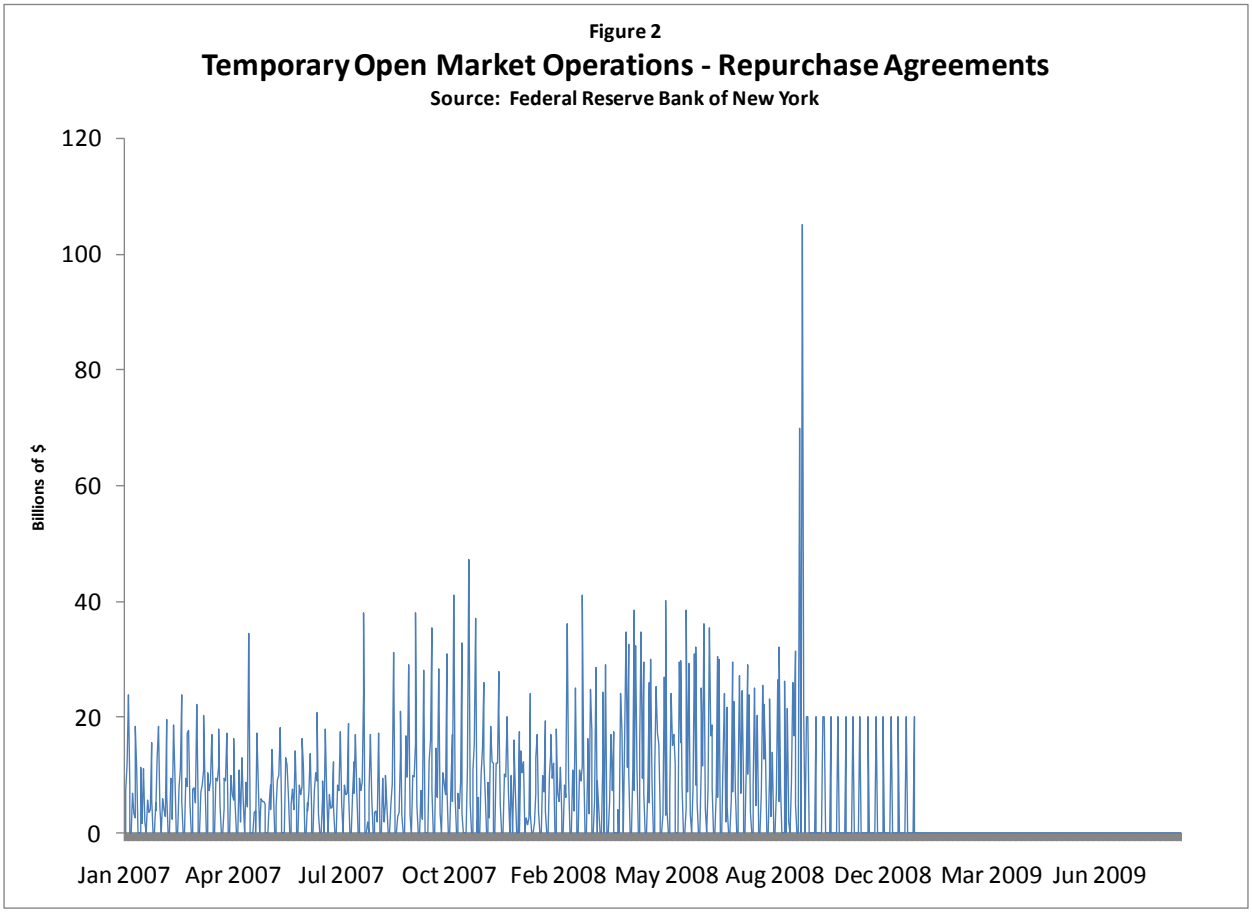

Temporary Open Market Operations - Repurchase Agreements
Source: Federal Reserve Bank of New York
Billions of $
120
100
80
60
40
20
0
Jan 2007
Apr 2007
Jul 2007
Oct 2007
Feb 2008
May 2008
Aug 2008
Dec 2008
Mar 2009
Jun 2009

Figure 3

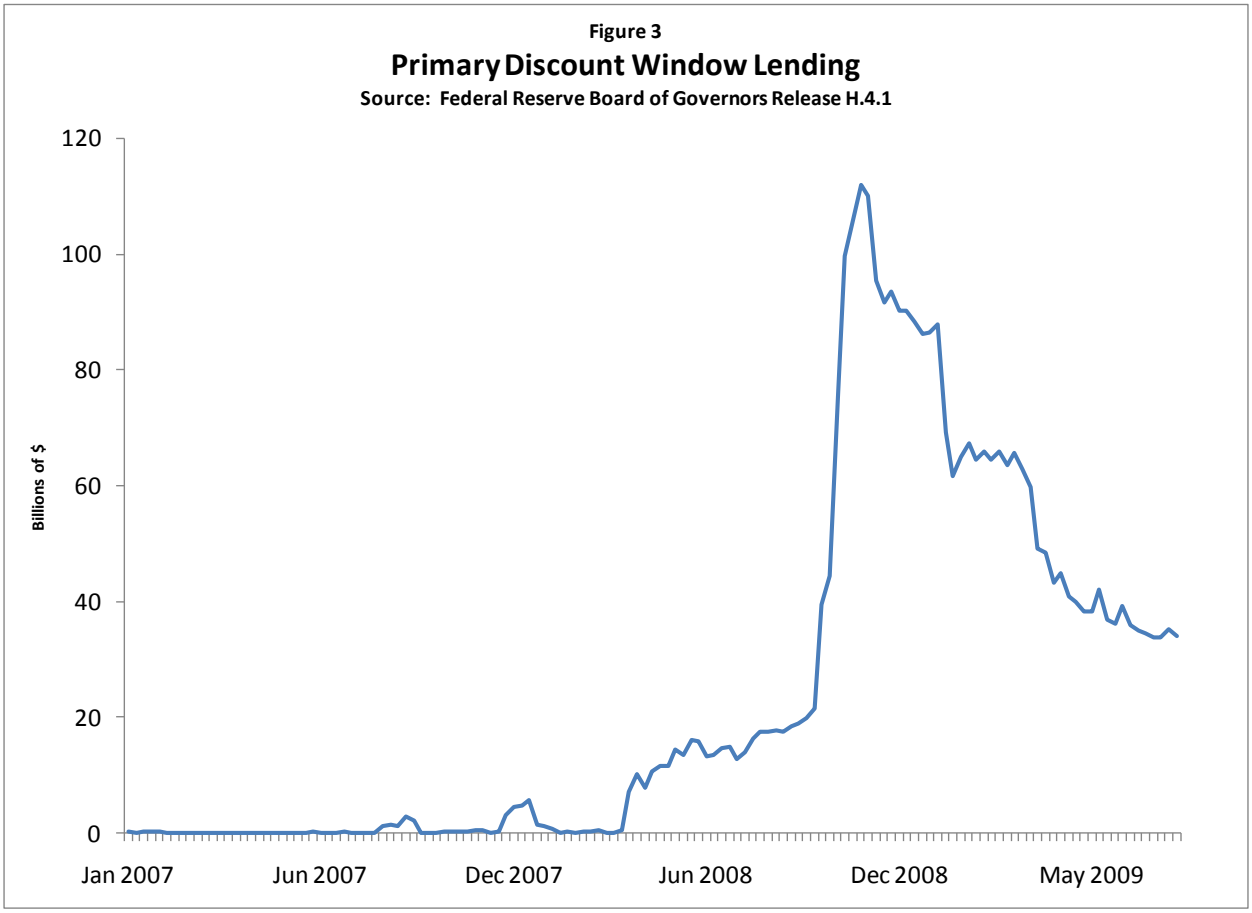

Primary Discount Window Lending
Source: Federal Reserve Board of Governors Release H.4.1
Billions of $
120
100
80
60
40
20
0
Jan 2007
Jun 2007
Dec 2007
Jun 2008
Dec 2008
May 2009

Figure 4

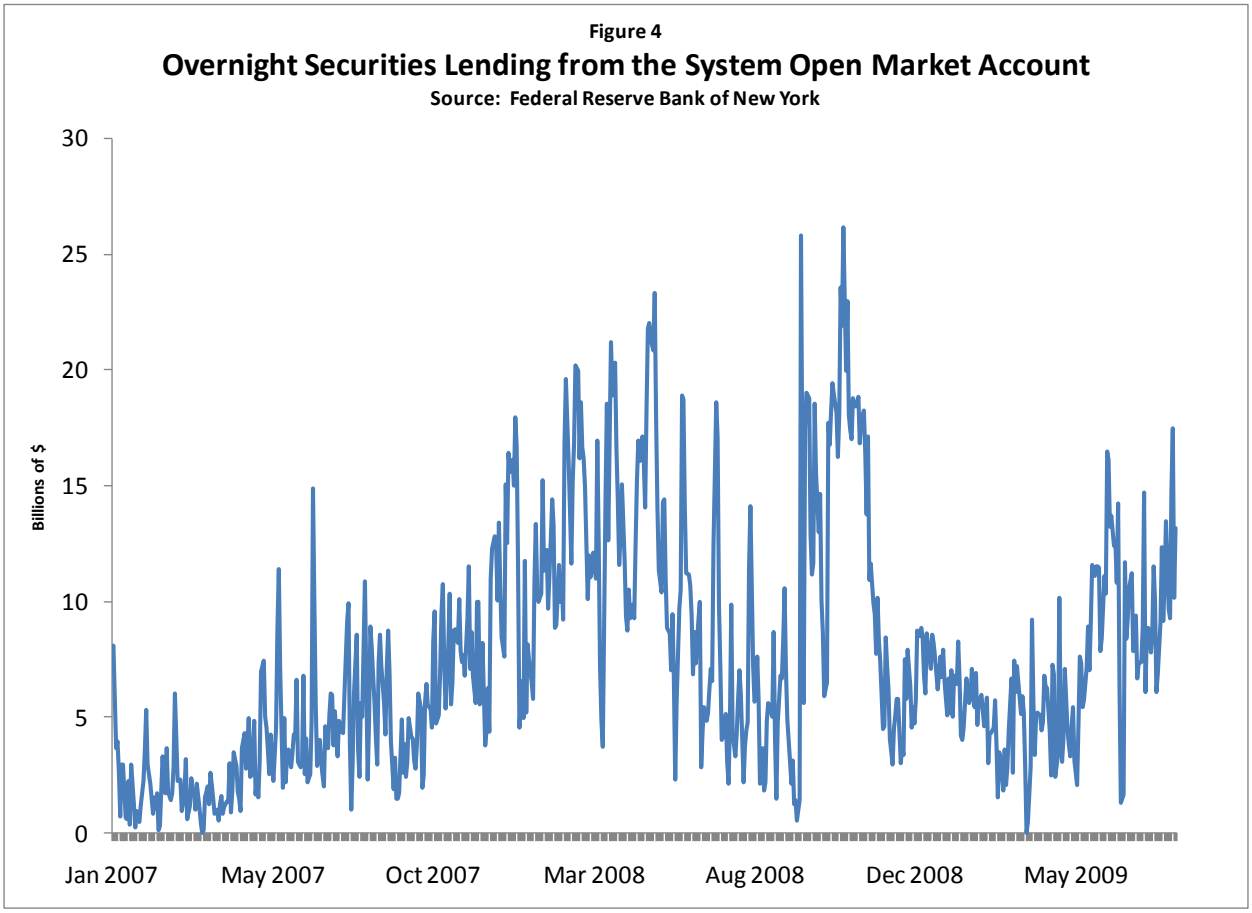

Overnight Securities Lending from the System Open Market Account
Source: Federal Reserve Bank of New York
Billions of $
30
25
20
15
10
5
0
Jan 2007
May 2007
Oct 2007
Mar 2008
Aug 2008
Dec 2008
May 2009

Figure 5

Term Auction Facility

Source: Federal Reserve Board of Governors

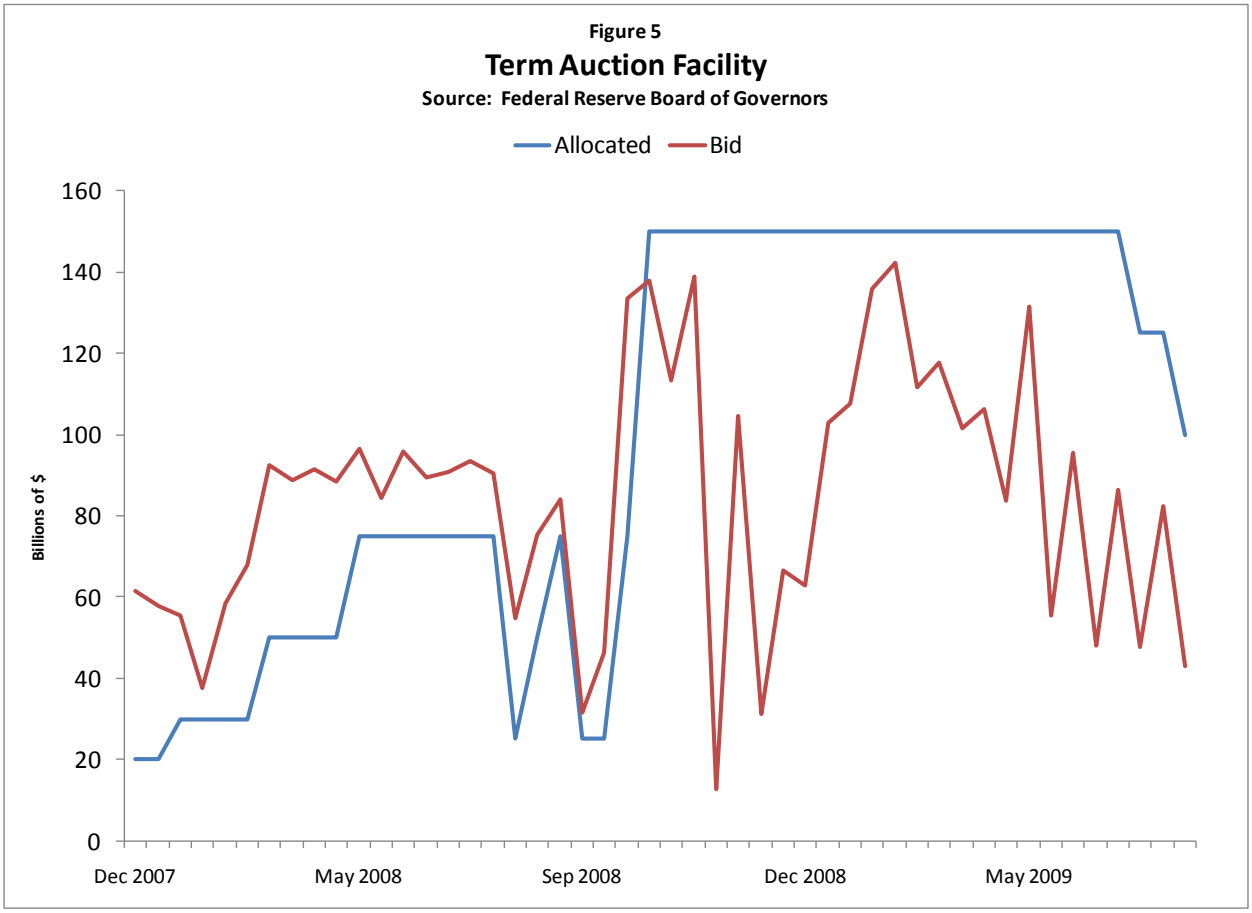


Figure 6

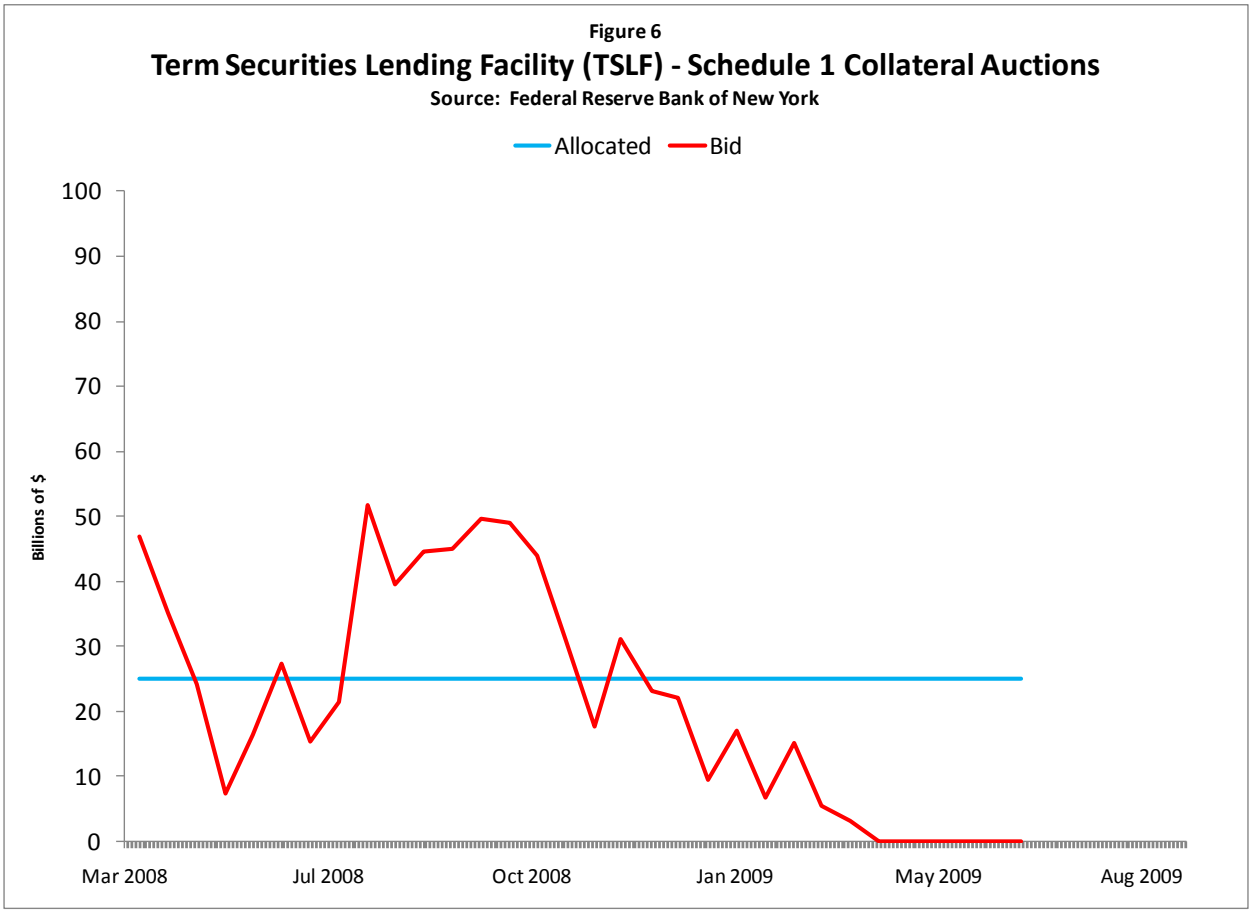

Term Securities Lending Facility (TSLF) - Schedule 1 Collateral Auctions
Source: Federal Reserve Bank of New York
Allocated
Bid
Billions of $
100
90
80
70
60
50
40
30
20
10
0
Mar 2008
Jul 2008
Oct 2008
Jan 2009
May 2009
Aug 2009

Figure 7

Term Securities Lending Facility (TSLF) - Schedule 2 Collateral Auctions

Source: Federal Reserve Bank of New York

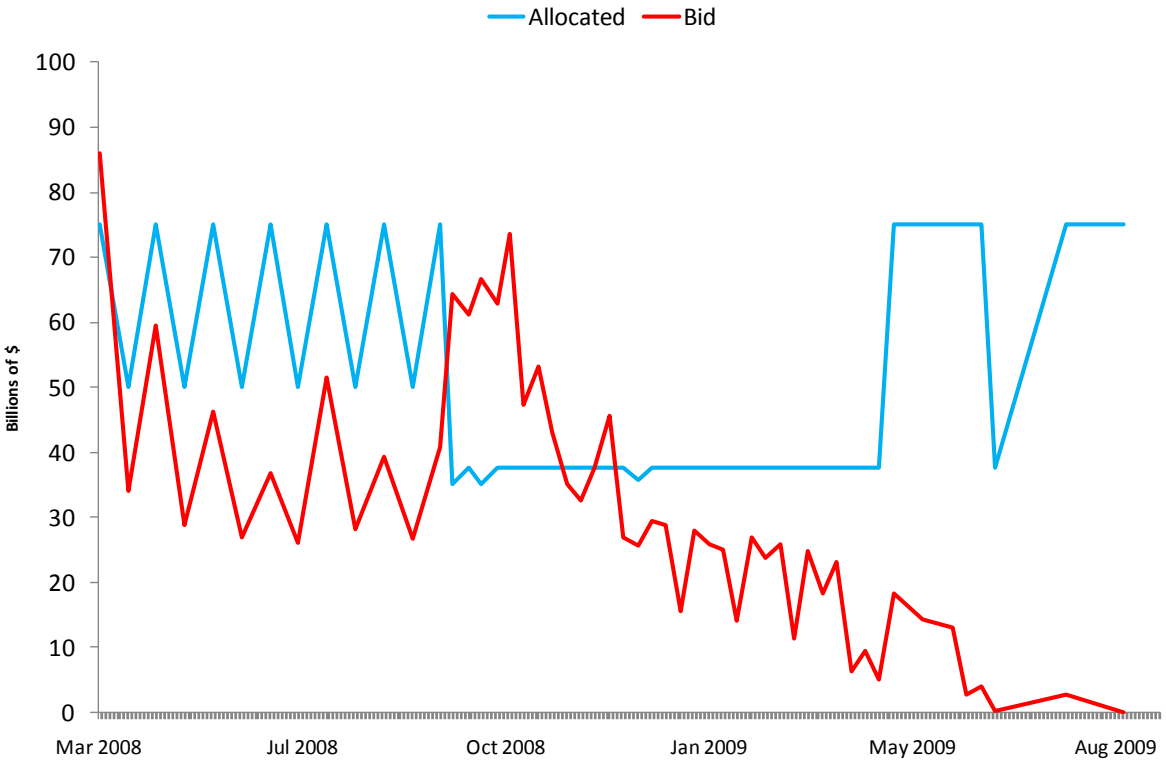


Figure 8

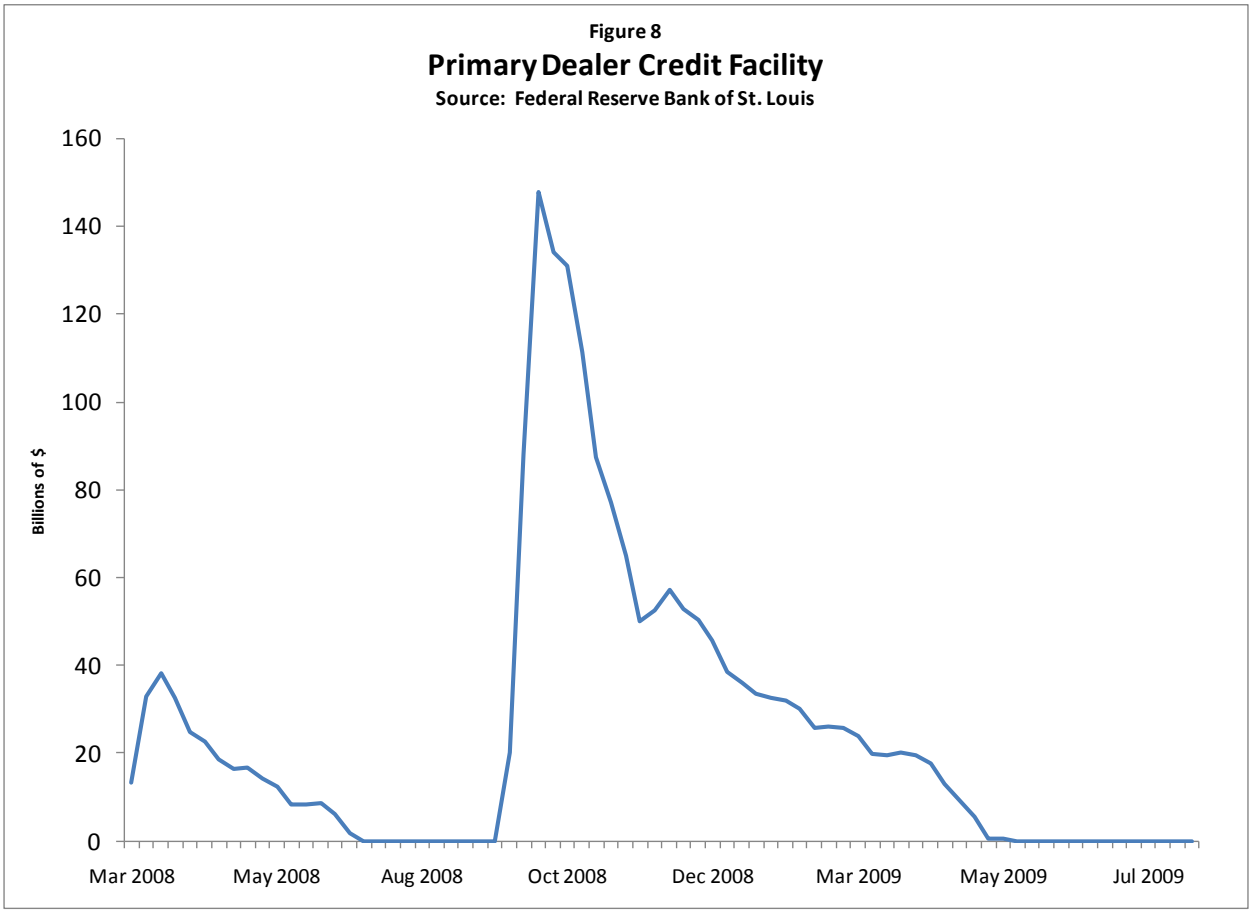
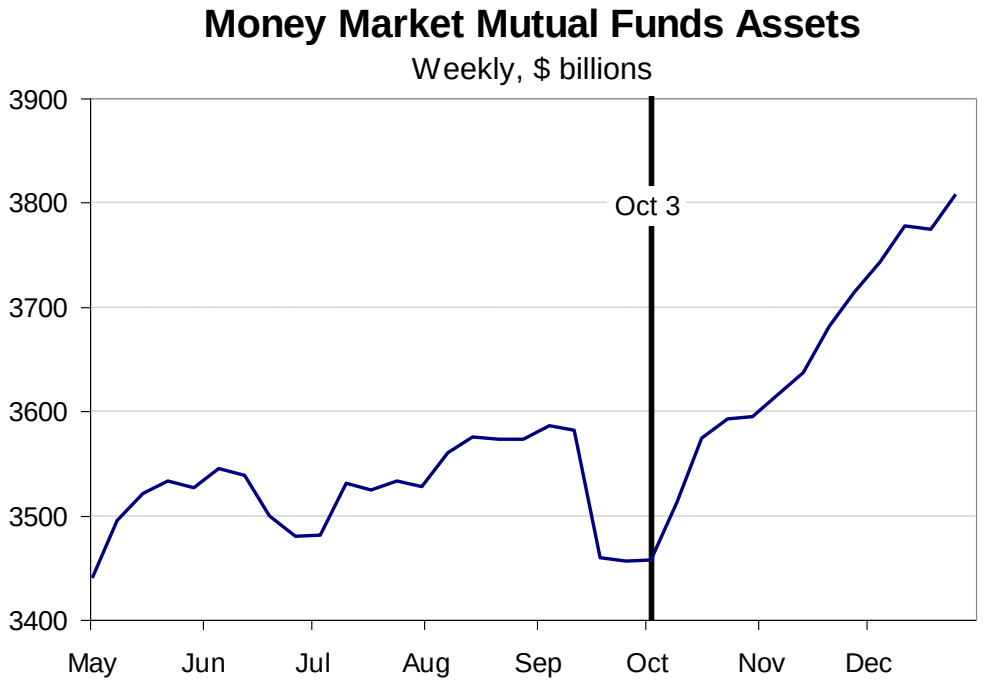

Primary Dealer Credit Facility
Source: Federal Reserve Bank of St. Louis
Billions of $
160
140
120
100
80
60
40
20
0
Mar 2008
May 2008
Aug 2008
Oct 2008
Dec 2008
Mar 2009
May 2009
Jul 2009

Figure 9



2

Source: Investment Company Institute

Figure 10

Asset-Backed Commercial Paper Money Market Mutual Fund Liquidity Facility

Source: Federal Reserve Bank of St. Louis

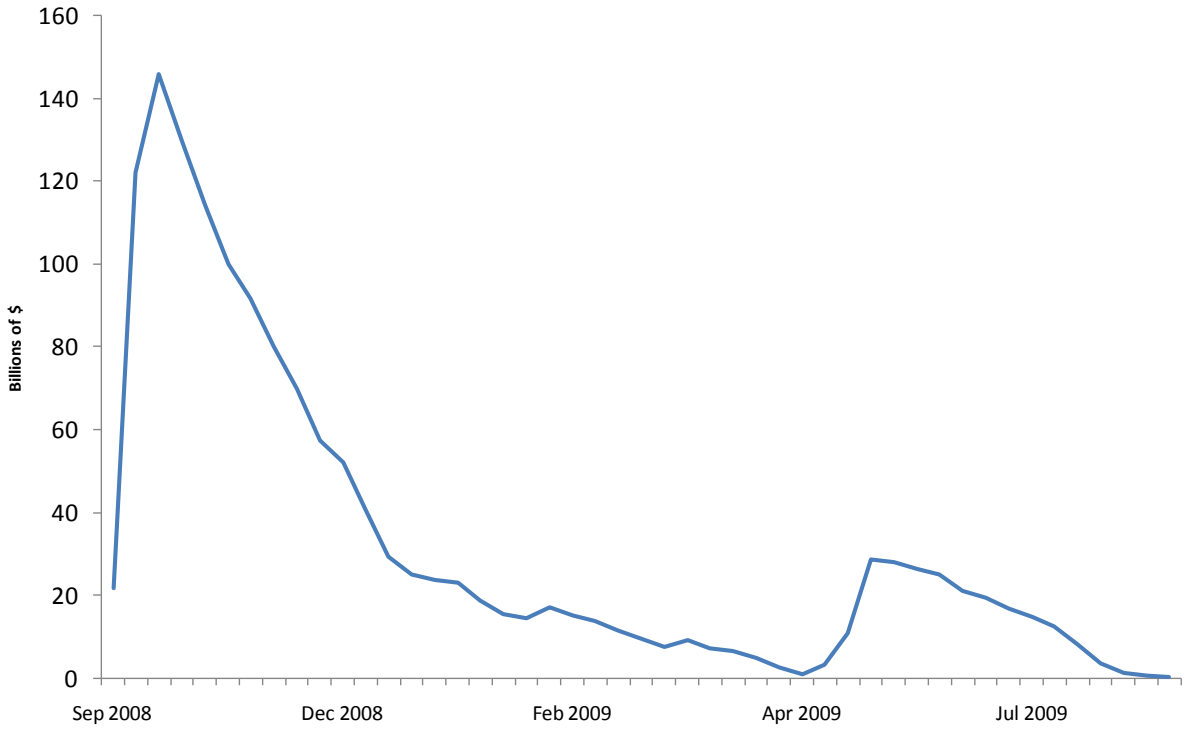


Figure 11
Three-Month LIBOR/OIS

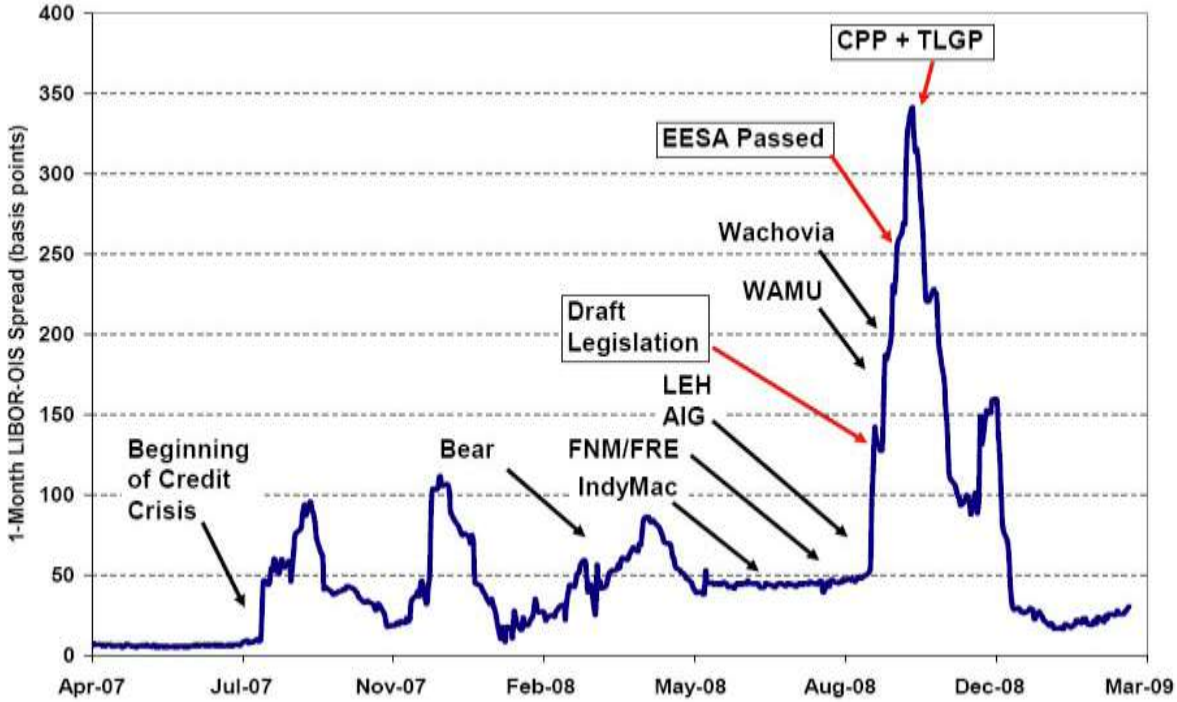


Figure 12

Commercial Paper Outstanding

Source: Federal Reserve Board

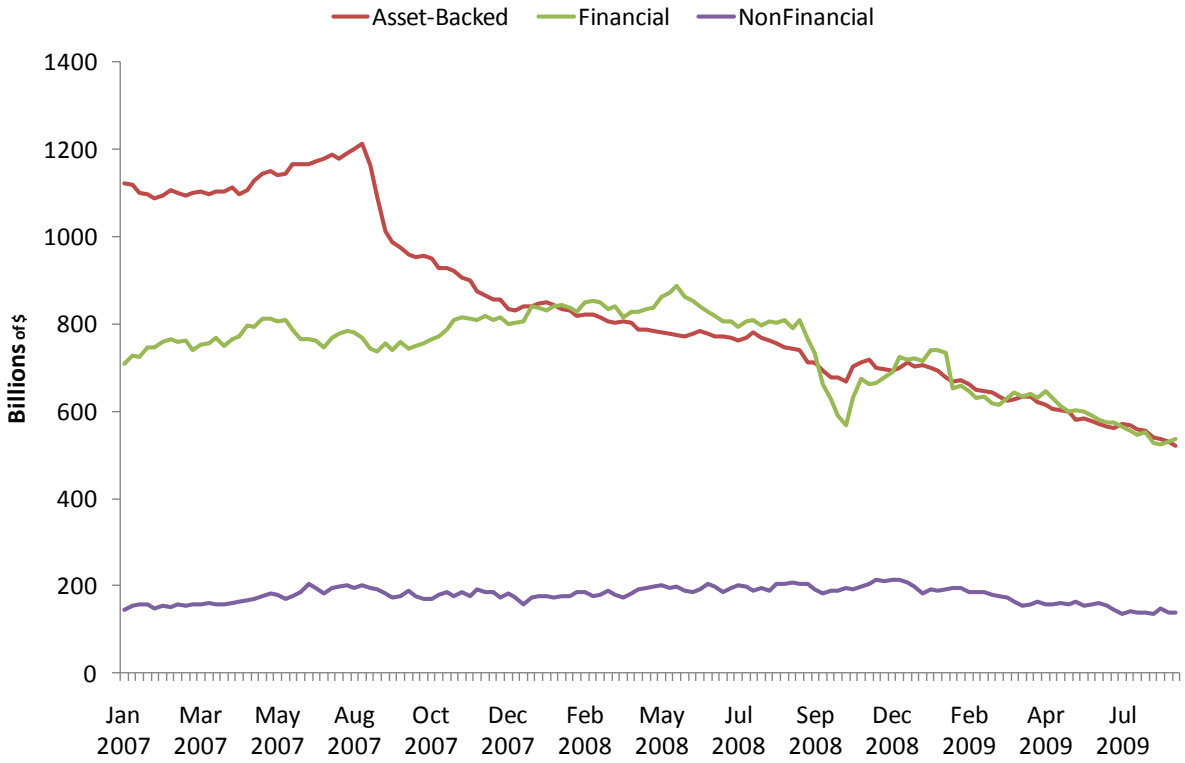


Figure 13

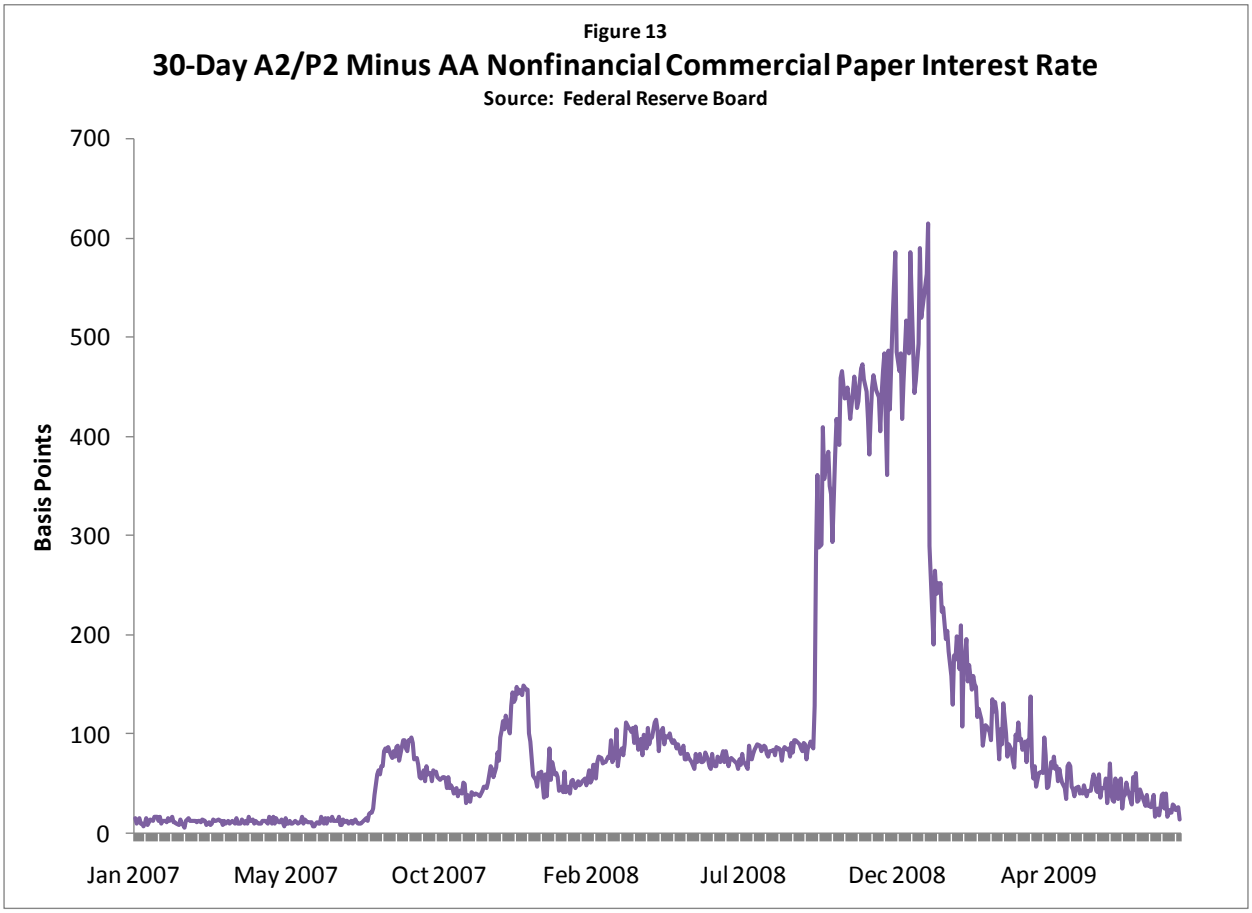

30-Day A2/P2 Minus AA Nonfinancial Commercial Paper Interest Rate
Source: Federal Reserve Board
Basis Points
700
600
500
400
300
200
100
0
Jan 2007
May 2007
Oct 2007
Feb 2008
Jul 2008
Dec 2008
Apr 2009

Figure 14

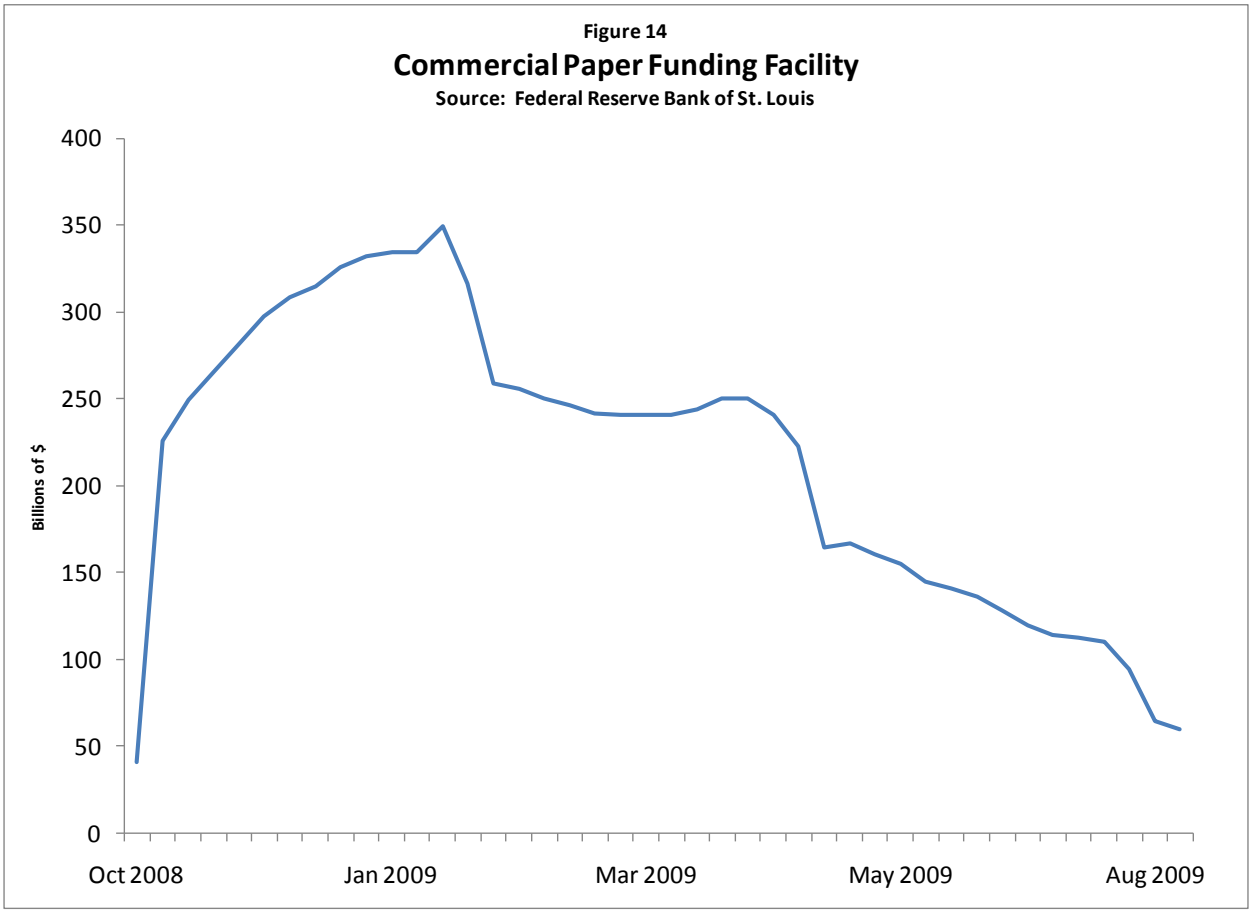

Commercial Paper Funding Facility
Source: Federal Reserve Bank of St. Louis
Billions of $
400
350
300
250
200
150
100
50
0
Oct 2008
Jan 2009
Mar 2009
May 2009
Aug 2009

Figure 15

Term Asset-Backed Securities Loan Facility

Source: Federal Reserve Bank of St. Louis

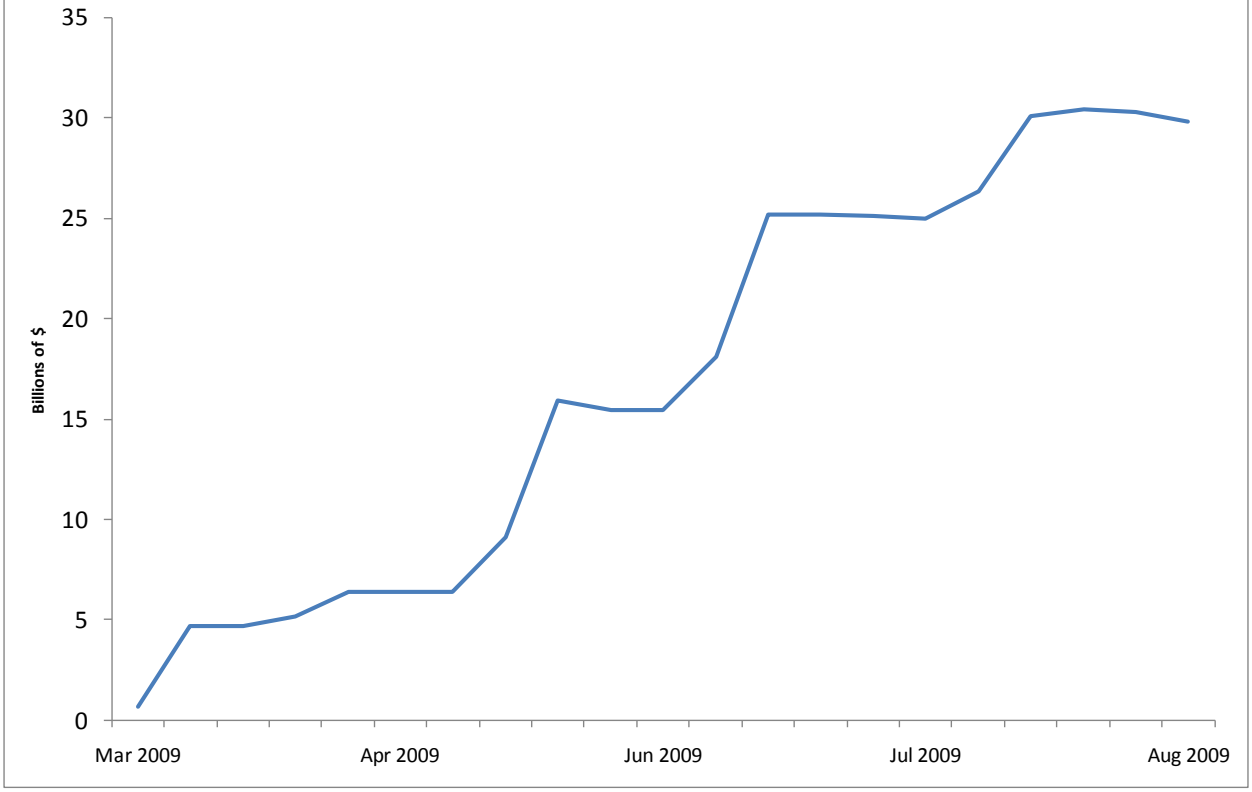


Figure 16

Federal Reserve Holdings of Securities

Source: Federal Reserve Board of Governors

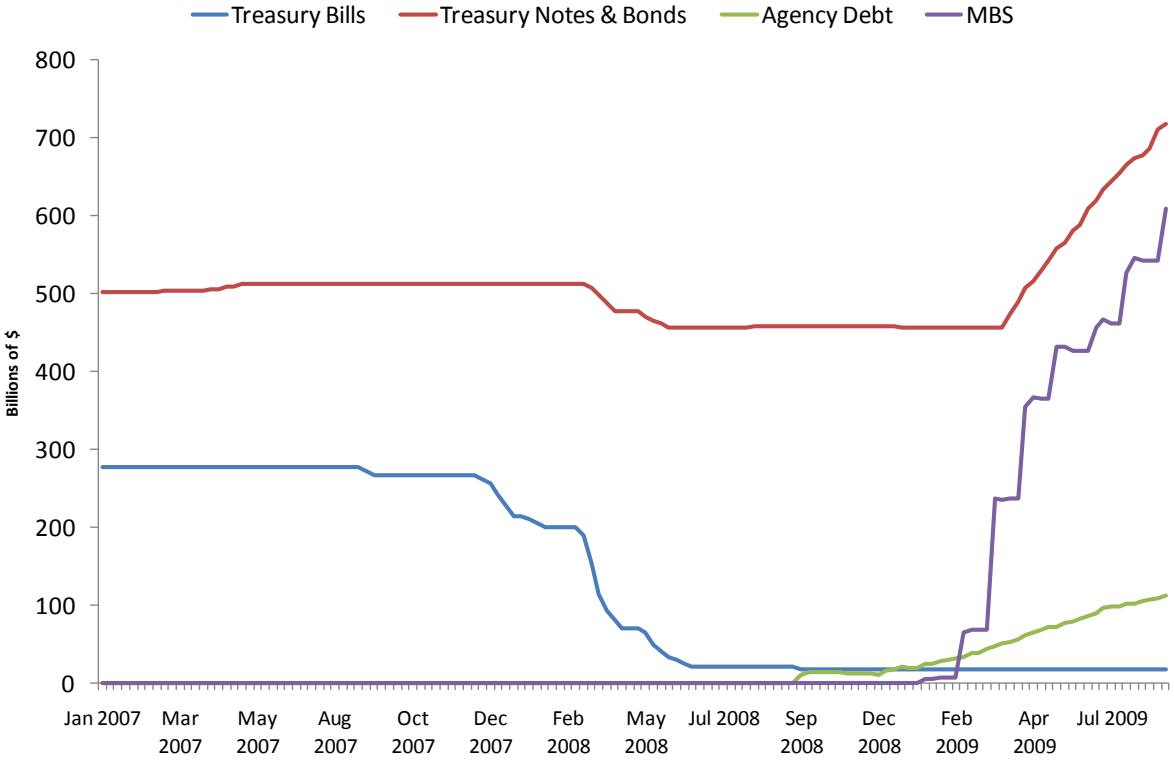


Table 1
Federal Reserve Nontraditional Policy Initiatives - Chronological

Description						Objectives		
Initiative	Announced	First Used	Status (Authorized Through)	Maximum Size (Billions)	Current Size (Billions)	Lengthen Maturity	Broaden Collateral	Expand Counterparties
Term Auction Facility	12/12/2007	12/17/2007		493	212	x		
Central Bank Swap Lines	12/12/2007	12/20/2007	2/1/2010	583	63			x
Term Securities Lending Facility	3/11/2008	3/27/2008	2/1/2010[6]	234	0	x		
Maiden Lane (Bear Stearns)	3/14/2008	6/26/2008	Ongoing	30	26		x	x
Primary Dealer Credit Facility[1]	3/16/2008	3/19/2007[2]	2/1/2010	148	0			x
Term Securities Lending Facility Options	7/30/2008	8/27/2008	Suspended[3]	50	0	x		
AIG								
FRBNY Lending to AIG	9/16/2008	9/17/2008[2]	Ongoing	90	39		x	x
Maiden Lane II	11/10/2008	12/12/2008	Ongoing	20	15		x	x
Maiden Lane III	11/10/2008	11/25/2008	Ongoing	28	21		x	x
Asset-Backed Commercial Paper Money Market Mutual Fund Liquidity Facility	9/19/2008	9/24/2008[2]	2/1/2010	152	0*		x	
Commercial Paper Funding Facility	10/7/2008	10/27/2008	2/1/2010	351	48		x	x
Money Market Investor Funding Facility	10/21/2008	Not used	10/30/2009	Not used	0		x	x
Citigroup Support	11/23/2008	Not used	Not used	Not used	0			x
Term Asset-Backed Securities Loan Facility	11/25/2008	3/25/2009	3/31/2010 6/30/2010[5]	30	37	x	x	x
Purchase of MBS guaranteed by GSEs	11/25/2008	1/5/2009	Ongoing	545	625	x		x
Purchases of direct GSE Debt	11/25/2008	12/5/2008	Ongoing	103	119	x		x
Bank of America Support	1/16/2009	Not Used	Not used	Not used	0			x
Purchases of Longer-Term Treasuries	3/18/2009	3/25/2009	Ongoing	221	288	x		

* Less than $500 million

1. Includes transitional support for Goldman Sachs, Morgan Stanly, and Merrill Lynch announced on 9/21/2008
2. Based on first appearance in the H.4.1 release
3. Suspension on 6/25/2009
4. Terminated on 11/10/2008
5. Loans against newly issued ABS and legacy CMBS authorized through March 31, 2010, loans against newly issued CMBS through June 30, 2010.
6. Auctions against Schedule 1 collateral suspended on 7/1/2009

Table 2
Federal Reserve Reciprocal Currency Arrangements (Swap Lines) with Other Central Banks
Billions of Dollars
Source: Federal Reserve Board of Governors and Federal Reserve Bank of New York

Dates of Arrangement and Limits on Lines

	2007	2008								
	Dec. 12	Mar. 11	May 2	July 30	Sep. 18	Sep. 24	Sep. 26	Sep. 29	Oct. 13/14	Oct. 28/29
European Central Bank	20	30	50	55	110	110	120	240	Unlimited	Unlimited
Swiss National Bank	4	6	12	12	27	27	30	60	Unlimited	Unlimited
Bank of Japan					60	60	60	120	Unlimited	Unlimited
Bank of England					40	40	40	80	Unlimited	Unlimited
Bank of Canada					10	10	10	30	30	30
Reserve Bank of Australia						10	10	30	30	30
Sveriges Riksbank						10	10	30	30	30
Danmarks National Bank						5	5	15	15	15
Norges Bank						5	5	15	15	15
Reserve Bank of New Zealand										15
Banco de Mexico										30
Bank of Korea										30
Banco Central do Brasil										30
Monetary Authority of Singapore.										30

Draws on Lines, End-of-Quarter and Most Recent

	2007	2008				2009				
	Dec. 31	Mar. 31	Jun. 30	Sep 30	Dec 31	Mar. 31	Jun. 30	Jul. 29		
European Central Bank	20	15	50	175	291	166	60	51		
Swiss National Bank	4	6	12	29	25	7	0*	0*		
Bank of Japan				30	123	61	18	9		
Bank of England				40	33	15	3	1		
Bank of Canada				0	0	0	0	0		
Reserve Bank of Australia				10	23	10	0*	0		
Sveriges Riksbank				0	25	23	12	12		
Danmarks National Bank				5	15	5	4	3		
Norges Bank				0	8	7	5	1		
Reserve Bank of New Zealand					0	0	0	0		
Banco de Mexico					0	0	3	3		
Bank of Korea					10	16	10	8		
Banco Central do Brasil					0	0	0	0		
Monetary Authority of Singapore.					0	0	0	0		

*Less than $0.5 Billion

Table 3 Federal Reserve Bank of New York Lending to Support Specific Institutions						
	Date Assistance Announced	Date Loan Extended	Amount of Loan (billions)	Fair Value Asset Coverage (billions)		
				12/31/2008	3/31/2009	6/30/2009
Maiden Lane	3/14/2008	6/26/2009	$28.820	-$3.403	-$3.771	-$3.400
Maiden Lane II	11/10/2008	12/12/2008	$17.232	-$0.329	-$1.965	-$2.371
Maiden Lane III	11/10/2008	12/25/2008	$20.757	$2.824	-$3.441	-$0.129

Table 4

FDIC Temporary Liquidity Guarantee Plan

Debt Issuance and Fees Assessed Under TLGP Debt Program

As of July 31, 2009 ($ mm)

Debt Issuance		Revenue Generate		
Number of Issuers	Debt Outstanding	Guarantee Fees	Surcharges	Total Revenue
94	$320,145	$8,560	$494	$9,054

The TLGP was adopted October 13, 2008. Qualifying institutions include.banks, thrifts, and certain holding companies. The program has two components. The first is a Debt Guarantee Program (DGP) and the second is Transaction Account Guarantee Program (TAGP). The DGP guarantees all newly issued senior unsecured debt up to prescribed limits issued by participating entities on or after October 14, 2008, through and including June 30, 2009.

The DGP guarantees all newly issued senior unsecured debt up to prescribed limits issued by participating entities on or after October 14, 2008, through and including June 30, 2009. The guarantee would not extend beyond June 30, 2012.

The TAGP provided for a temporary full guarantee by the FDIC for funds held at FDIC-insured depository institutions in noninterest-bearing transaction accounts above the existing deposit insurance limit. This coverage became effective on October 14, 2008, and would continue through December 31, 2009 (assuming that the insured depository institution does not opt-out of this component of the TLG Program). The guarantee does not include money market deposit accounts.

Beginning on November 13, 2008, any eligible entity that had not opted out of the Debt Guarantee Program would be assessed fees for continued coverage. All eligible debt issued by such entities from October 14, 2008 (and still outstanding on November 13, 2008), through June 30, 2009, would be charged an annualized fee equal to 75 basis points multiplied by the amount of debt issued, and calculated for the maturity period of that debt or June 30, 2012, whichever was earlier.

Beginning on November 13, 2008, if an insured depository institution did not opt-out of the Transaction Account Guarantee Program, it would be assessed on a quarterly basis an annualized 10 basis point assessment on balances in noninterest-bearing transaction accounts that exceed the existing deposit insurance limit of $250,000.

On March 18, 2009 the FDIC extended until October 31, 2009 the date by which depository institution participants in the program may issue guaranteed senior unsecured debt. For debt issued after April 1, 2009 under the TLGP, the guarantee has been extended until the earlier of maturity or December 31, 2012. The FIDC imposes surcharges on certain guaranteed debt issued under the program after April 1, 2009

Table 5

TARP Capital Purchase Program Repayments

Capital Repaid and Proceeds from CPP for the Largest Financial Institutions

As of September 1, 2009 ($ mm)

	Mean	Median	Max	Min	Total
Investment Size	$9,618	$4,850	$25,000	$2,000	$163,514
Repaid	$7,409	$3,555	$25,000	$2,000	$66,677
% Repaid					40.8%
Proceeds from Investment:					
Dividends Accrued	$340	$185	$1,055	$64	$5,776
Warrants Liquidated	$399	$139	$1,100	$60	$2,792
Proceeds					$8,568
% of Investment					5.2%
Excess Proceeds from Citi Stock					$9,922
Proceeds Including Citi Stock					$18,490
% of Investment					11.3%

The sample includes the 17 of the 19 instutitions included in government stress tests: Bank of America, Bank of New York, BB&T, Citigroup, Capital One, Fifth Third, Goldman Sachs, JPMorgan, KeyCorp, Morgan Stanley, PNC, Regions, State Street, SunTrust, U.S. Bancorp, and Wells Fargo. The two excluded are MetLife and GMAC. MetLife and GMAC did not receive CPP funds.

The government investment consists of senior preferred shares. During the first five years of this investment the taxpayer will be paid a dividend of 5% per year on the senior preferred shares. This coupon steps up to 9% per year in the sixth year. Moreover, participating public institutions issue warrants to purchase common stock having an aggregate market price equal to 15% of the senior preferred investment.

The government's $25bn in preferred shares in Citigroup were converted into common stock in two stages on July 23 and 25, 2009. Excess Proceeds from Citi Stock values the government's position in Citigroup stock at $4.54 a share (the price as of September 1, 2009) and subtracts the initiation capital investment of $25bn.