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**Research Report**

## A detailed look at the Fed's crisis response by funding facility and recipient

Public Policy Brief, Jerome Levy Economics Institute of Bard College, No. 123

**Provided in Cooperation with:**

Levy Economics Institute of Bard College

Suggested Citation: Felkerson, James Andrew (2012) : A detailed look at the Fed's crisis response by funding facility and recipient, Public Policy Brief, Jerome Levy Economics Institute of Bard College, No. 123, ISBN 978-1-936192-21-2

This Version is available at:

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Levy Economics Institute of Bard College

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# ***Public Policy Brief***

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No. 123, 2012

## **A DETAILED LOOK AT THE FED'S CRISIS RESPONSE BY FUNDING FACILITY AND RECIPIENT**

JAMES ANDREW FELKERSON

# Contents

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## **3 Preface**

Dimitri B. Papadimitriou

## **4 A Detailed Look at the Fed's Crisis Response by Funding Facility and Recipient**

James Andrew Felkerson

## **21 About the Author**

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The Public Policy Brief Series is a publication of the Levy Economics Institute of Bard College, Blithewood, PO Box 5000, Annandale-on-Hudson, NY 12504-5000.

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ISSN 1063 5297  
ISBN 978-1-936192-21-2

## Preface

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As part of the Ford Foundation project “A Research and Policy Dialogue Project on Improving Governance of the Government Safety Net in Financial Crisis,” James Felkerson, University of Missouri–Kansas City, has undertaken a comprehensive examination of the raw data on the Federal Reserve’s unconventional efforts to shore up the financial system in response to the 2007–09 crisis. The extraordinary challenge represented by that crisis provoked an extraordinary reaction by the Fed in the enactment of its role as lender of last resort. This policy brief provides a descriptive account of the Fed’s unconventional efforts as a first step in the process of both evaluating that response and thinking about how to set Fed policy for future crises.

The brief begins by summarizing the three measures used to determine the size and scope of the Fed’s interventions. It then outlines the unconventional facilities and programs that were created by the central bank in an attempt to stabilize the financial structure. The Fed’s activities are organized into three distinct “stages,” each one corresponding to a particular set of policy tools. As many of these programs and facilities were aimed at specific classes of markets or even specific financial institutions, the brief also highlights those markets and institutions that were the targets of the Fed’s interventions and provides a breakdown of the support provided to the major recipients. Where relevant, the amounts paid back or outstanding as of March 1, 2012, are noted.

The focus is placed on the unconventional actions that were initiated after the Fed had exhausted its conventional lender-of-last-resort operations—which is to say, excluding such tools as the provision of liquidity through open market operations or through direct lending to institutions via the discount window. Three different ways of measuring the Fed’s unconventional stabilization efforts over the course of the crisis are presented. First, the brief tallies the peak outstanding amounts committed by the Fed at a given point in time. Second, it reports the peak flow of loans and asset purchases over a period of time. And finally, the brief puts together a cumulative measure of the total amount of loans and asset purchases from January 2007 to March 2012. This

last measure is informed by the view that each unconventional intervention by the Fed represents an instance in which private markets failed to perform their usual functions (of intermediation and liquidity provisioning). The three measurements are provided for each of the major facilities and purchasing programs, across all three stages. Aggregate totals are then provided for all of the Fed’s unconventional operations over the period January 2007 – March 2012.

The three ways of measuring the Fed’s response serve to highlight different aspects of the crisis and the central bank’s role. Selecting the appropriate measure depends on the question being asked. The peak outstanding amount—the size of the balance sheet at a point in time—represents the maximum risk of loss faced by the central bank. The second measure, registering the peak flow of loans and asset purchases over a span of time, allows us to track the more severe periods of financial system distress. The final, cumulative measure of every individual unconventional transaction—an amount more than twice US GDP—gives us a picture of the sheer magnitude of the Fed’s interventions in its attempts to stabilize the financial structure.

As always, I welcome your comments.

Dimitri B. Papadimitriou, *President*  
March 2012

## Introduction

There have been a number of estimates of the total amount of funding provided by the Federal Reserve to stabilize the financial system in the period 2007–11. Congress, led by Senator Bernie Sanders, ordered the Fed to provide a detailed account of its rescue efforts, and a successful Freedom of Information Act suit by Bloomberg News resulted in a “dump” of 29,000 pages of raw data on the Fed’s actions. Although Bloomberg has claimed that the cumulative “spending” by the Fed (this includes asset purchases plus lending) was \$7.77 trillion, reports have not been sufficiently detailed to determine exactly what was included in that total.

We have conducted the most comprehensive investigation of the raw data to date. We present three different measures, each of which is important in capturing a different aspect of the Fed’s actions. First, we look at the peak outstanding commitment at a given point in time. From this angle, we arrive at a number relatively close to the Fed’s own estimate, which gives some measure of the maximum risk of loss faced by the Fed. Second, we calculate the total peak flow of commitments (loans plus asset purchases) over a relatively short period such as a week or a month, which helps identify periods of maximum financial system distress. And, finally, we calculate the total amount of loans and asset purchases made over the entire period, from January 2007 to March 2012, which helps round out the full picture of the Fed’s interventions. This third number, which as we will explain is a cumulative measure (e.g., a \$1 loan renewed every morning over the course of a year would be counted as a \$365 loan using this measure), reveals that the total Fed response was over \$29 trillion. Each of these three measures serves a purpose, providing a different way of understanding and evaluating the Fed’s response, and choosing which one to focus on depends on the

question being asked. Providing this descriptive account from such varying angles is a necessary first step in any attempt to fully understand the actions of the central bank in this critical period—and a prerequisite for thinking about how to shape policy for future crises.

This is the first in a series of reports in which we will present our results. We hope that other researchers will compare these results with their own, and are providing detailed breakdowns to aid in such comparisons. The extraordinary scope and magnitude of the financial crisis of 2007–09 required an extraordinary response by the Fed in the fulfillment of its lender-of-last-resort (LOLR) function. In an attempt to stabilize financial markets during the worst financial crisis since the Great Crash of 1929, the Fed engaged in loans, guarantees, and outright purchases of financial assets that were not only unprecedented, but cumulatively amounted to over twice current US gross domestic product as well. The purpose of this brief is to provide a descriptive account of the Fed’s response to the recent financial crisis—to delineate the essential characteristics and logistical specifics of the veritable “alphabet soup” of LOLR machinery rolled out to save the world financial system.

We begin with an overview of the crisis and the Federal Reserve’s role. We then make a brief statement regarding the approach we have adopted in developing a suitable methodology with which to measure the scope and magnitude of the Fed’s crisis response. The core of the paper follows, outlining the unconventional facilities and programs aimed at stabilizing (or “saving”) the existing financial structure. Only facilities in which transactions were conducted are considered in the discussion—some facilities were created but never used. The paper concludes with a summary of the scope and magnitude of the Fed’s crisis response.

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## Frequently Used Acronyms

AIG Revolving Credit Facility	RCF	Government-sponsored entity	GSE
AIG Securities Borrowing Facility	SBF	GSE Direct Obligation Purchase Program	GSEP
Agency Mortgage-Backed Security Purchase Program	AMBSMBS	Maiden Lane I, II, III	ML 1, ML II, ML III
Asset-Backed Commercial Paper Money Market Mutual Fund Liquidity Facility	AMLF	Mortgage-backed security	MBS
Central Bank Liquidity Swap	CBLS	Primary Dealer Credit Facility	PDCF
Commercial Paper Funding Facility	CPFF	Term Asset-Backed Securities Loan Facility	TALF
		Term Auction Facility	TAF
		Term Securities Lending Facility	TSLF
		TSLF Options Program	TOP
		Single-tranche open market operations	ST OMO

## Overview of the Crisis Response

The explicit objective of LOLR operations is to halt the initiation and propagation of financial instability through the provision of liquidity to individual financial institutions or financial markets, or both. At any given moment in time, the available supply of ultimate liquidity is determined by the actions of the Fed and the US Treasury. As the LOLR to solvent financial institutions, the Fed has traditionally found it satisfactory to accomplish its LOLR responsibility through conventional channels. The conventional tools are threefold.

When acting as the LOLR, the Fed can increase the availability of liquidity by lending directly to institutions through the discount window. Transactions of this nature are conducted at the initiative of participants. It can also make the terms upon which it lends to institutions more generous by decreasing the rate it charges for borrowing or lengthening the repayment period for loans. In recent years, however, preoccupation with control of the money stock has shifted emphasis from measures conducted at the initiative of the borrower to those undertaken at the initiative of the Fed. This new line of thinking holds that the provision of liquidity in times of crisis should be executed through the medium of open market operations. According to this way of thinking, the market mechanism will efficiently allocate liquidity to those who have the greatest need during times of heightened demand. This third method has come to dominate in Fed actions.

In response to the gathering financial storm, the Fed acted quickly and aggressively through conventional means by slashing the federal funds rate from a high of 5.25 percent in August 2007 to effectively zero by December 2008. The Fed also decreased the spread between its primary lending rate at the discount window and the federal funds rate to 50 basis points on August 17, 2007, and extended the term from overnight to up to 30 days. On March 16, 2008, the Fed further reduced the spread to 25 basis points and extended terms up to 90 days. However, the efficacy of the Fed's conventional LOLR tools had little appreciable effect during the initial stages of the recent financial crisis. Moreover, the period of moderation brought about by such measures was of relatively short duration. These actions largely failed to ameliorate rapidly worsening conditions in opaque markets for securitized products such as mortgage-backed securities (MBSs).

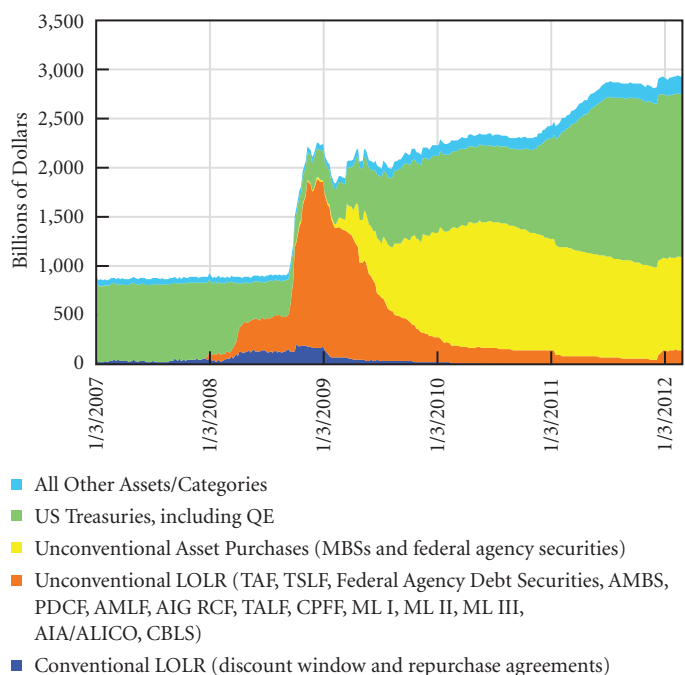
In an attempt to counter the relative ineffectiveness of its conventional LOLR tools, the Fed designed and implemented a host of unconventional measures, unprecedented in terms of size

and scope. The goal of these unconventional measures was to explicitly improve financial market conditions and, by improving the intermediation process, to stabilize the US economy as a whole. The authorization of many of these measures would require the use of what was, until the recent crisis, an ostensibly archaic section of the Federal Reserve Act (FRA)—section 13(3)—which gave the Fed the authority “under unusual and exigent circumstances” to extend credit to individuals, partnerships, and corporations.<sup>1</sup>

As part of its effort to halt growing financial instability, the Fed ballooned its balance sheet from approximately \$900 billion in September 2008 to more than \$2.9 trillion dollars as of March 1, 2012. Figure 1 depicts the weekly composition of the asset side of the Fed's balance sheet from January 3, 2007, to March 1, 2012, and distinguishes between the Fed's conventional and unconventional LOLR operations.

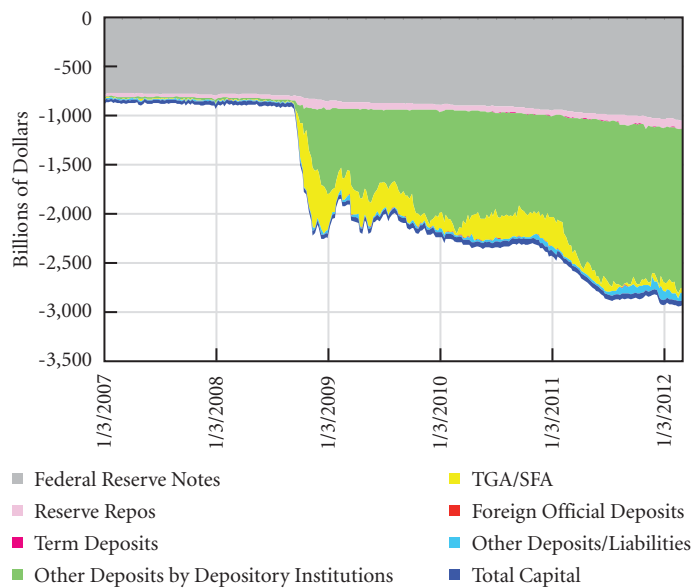
As is clearly indicated in the graph, the Fed's response to events of that fateful autumn of 2008 resulted in an enlargement of its balance sheet from \$905.6 billion in early September 2008 to \$2,259 billion by the end of the year—an increase of almost 150 percent in just three months! This initial spike in the size of

**Figure 1 Federal Reserve Assets, January 3, 2007 – March 1, 2012 (in billions of dollars)**



Sources: Federal Reserve H.4.1 Weekly Statistical Releases and other Fed sources

**Figure 2 Federal Reserve Liabilities, January 3, 2007 – March 1, 2012 (in billions of dollars)**



Sources: Federal Reserve H.4.1 Weekly Statistical Releases and other Fed sources

the Fed’s balance sheet reflects the coming online of a host of unconventional LOLR programs, and depicts the extent to which the Fed intervened in financial markets. The graph also depicts the winding down of unconventional tools starting in early 2009. However, the decrease in the size of the Fed’s balance sheet was of short duration, as the focus of the Fed shifted from liquidity provisioning to the purchase of long-term securities—which, as of March 1, 2012, composed approximately 88 percent of the Fed’s balance sheet.

Figure 2 shows the structure of Fed liabilities over the same period. Casual inspection of the graph indicates the expansion of the Fed’s balance sheet was accomplished entirely through the issuance of reserve balances, creating liquidity for financial institutions.

## Methodology

Before moving on to an analysis of the characteristics of each of the facilities implemented by the Fed in its response to the crisis, a methodological note is in order. We have elected to adopt a twofold approach to measuring the scale and magnitude of the Fed’s actions during and since the financial crisis. The composition of the Fed’s balance sheet is expressed in terms of stocks;

that is, it reflects the Fed’s asset and liability portfolio *at a moment in time*. However, the provision of liquidity, in the form of the Fed’s creation of reserves through asset purchases, manifests itself as a flow. The outstanding asset and liability balances held by the Fed adjust as transactions are conducted. This is simply a definitional outcome of double-entry accounting. When private sector economic units repay loans or engage in liquidity-absorbing transactions, the Fed’s balance sheet shrinks. Conversely, when private sector agents participate in liquidity-increasing transactions with the Fed, the Fed’s balance sheet grows in size.

The changing composition and size of the Fed’s balance sheet offers great insight into the scope of the Fed’s actions since the crisis. The initiation of new and unconventional crisis programs represented new methods of Fed intervention in financial markets. Furthermore, given that many of the programs were specifically targeted at classes of financial institutions or markets, and later at specific financial instruments, we are able to identify the markets and individual institutions that the Fed deemed worthy of “saving.” To account for changes in the composition of the Fed’s balance sheet as transactions occur and are settled, we shall report two variables referencing the weekly influence of an unconventional facility on the composition and size of the asset side of the Fed’s balance sheet: the weekly amount outstanding (stock) and the weekly amount lent (flow). The amount outstanding adjusts due to the repayment process but fails to capture the entire picture. The complete picture emerges when we include the weekly amount lent. As will be seen, many of the unconventional actions taken by the Fed were the result of a targeted response to a particularly traumatic event. Given that the respective facilities reflect different terms of repayment, and that initial usage of a crisis facility after an adverse shock was generally large, the amount outstanding will often increase to a high level and remain there until transactions are unwound. This is captured by the aforementioned “spike” in the Fed’s balance sheet. Considering the disparity between lending and repayment, special emphasis will be placed on the peak dates for the amounts lent and outstanding, since such time periods were often associated with excessive turmoil in financial markets. However, this leaves us with a dilemma: how are we to measure the magnitude of the Fed’s efforts?

Our attempt to capture the magnitude of the Fed’s efforts is informed by the idea that when the Fed operates as LOLR, it interrupts the normal functioning of the market process (Minsky 2008 [1986]). To provide a complete account of the Fed’s extraordinary response, we argue that each unconventional



transaction by the Fed represents an instance in which private markets were incapable or unwilling to conduct normal intermediation and liquidity provisioning activities. We exclude actions directed at the implementation of monetary policy, or what have been identified as the conventional tools of LOLR operations. Thus, to report the magnitude of the Fed's unconventional rescue efforts, we have calculated cumulative totals by summing each transaction conducted by the Fed. It is hoped that reference to the changing composition of the Fed's balance sheet and cumulative totals will present a narrative regarding the scope of the Fed's crisis response as well as inform readers as to the sheer enormity of the Fed's response.

To sum up, there are three different measures that we will report. The appropriate measure chosen depends on the question being asked. First, there is the size of the Fed's balance sheet *at a point in time*—the sum of its assets and liabilities. That tells us how much ultimate liquidity the Fed has provided; it also gives some measure of the risks to the Fed (e.g., by looking at its stock of risky assets purchased from banks). Next, there is the *flow of lending over a period*, as a new facility is created to deal with an immediate need for funds. Spikes will indicate particular problems in the financial sector that required the Fed's intervention. Finally, there is the *cumulative total* of all the funds supplied by the Fed outside "normal" monetary policy operations, which gives an idea of the scope of the impact of the global financial crisis.

### **The Facilities Created in Response to the Crisis**

Several times, the Fed has issued public statements arguing that its crisis response machinery was implemented sequentially and consists of three distinct "stages." Each "stage" is represented by a specific policy tool and can be broadly viewed as a response to the evolution of the crisis as it proliferated through financial markets. The characteristics of each facility within the different stages were largely conditioned by a more or less shared set of objectives.<sup>2</sup> The presentation of the Fed's response as sequential responding to events is useful for the categorization of the unconventional LOLR operations. The rationale for and purpose of the programs initiated during the different stages is indeed chronologically associated with economic events. However, this approach has a major shortcoming in that it does not take into account actions on the part of the Fed that were directed at specific institutions. We have chosen to adopt the stages approach due to its merit as a narrative explaining the Fed's response to major events

over the course of the crisis, and included the support provided by the Fed to specific institutions that occurred within the period of time with which a stage is identified. Within each stage, we shall present the individual facilities in chronological order.

### **Stage 1: Short-Term Liquidity Provision**

Crisis facilities associated with Stage 1 were aimed at providing short-term liquidity to solvent banks and other depository institutions as well as to other types of financial institution (Bernanke 2009). Facilities mobilized under the auspices of Stage 1 were aimed at "improving aggregate liquidity and also the distribution of liquidity across financial intermediaries" (Sarkar 2009). Both Sarkar (2009) and Bernanke (2009) identify the objectives of the Stage 1 facilities as being consistent with the intent of the Fed's traditional LOLR mandate.

#### ***Term Auction Facility***

The Term Auction Facility (TAF) was announced on December 12, 2007. The TAF was authorized under section 10B of the FRA and was "designed to address elevated pressures in short-term funding markets" (Federal Reserve 2007). Historically, depository institutions have obtained short-term liquidity during times of market dislocation by borrowing from the discount window or from other financial institutions. However, the "stigma" associated with borrowing from the discount window led many depository institutions to seek funding in financial markets.<sup>3</sup> Given pervasive concern regarding liquidity risk and credit risk, institutions resorting to private markets were met with increasing borrowing costs, shortened terms, or credit rationing. To address this situation, the TAF provided liquidity to depository institutions via an auction format. The adoption of an auction format allowed banks to borrow as a group and pledge a wider range of collateral than generally accepted at the discount window, thus removing the resistance to borrowing associated with the "stigma problem." Each auction was for a fixed amount of funds, with the rate determined by the auction process (Federal Reserve 2008a, 219). Initially, the auctions offered a total of \$20 billion for 28-day terms. On July 30, 2008, the Fed began to alternate auctions on a biweekly basis between \$75 billion, 28-day term loans and \$25 billion, 84-day credit.

The TAF ran from December 20, 2007, to March 11, 2010. Both foreign and domestic depository institutions participated in the program. A total of 416 unique banks borrowed from this facility. Table 1 presents the five largest borrowers in the TAF. As for



**Table 1 Top Five TAF Borrowers (in billions of dollars)**

Parent Company	Total	Percent of All TAF Loans
Bank of America	280	7.3
Barclays (UK)	232	6.1
Royal Bank of Scotland (UK)	212	5.5
Bank of Scotland PLC (UK)	181	4.7
Wells Fargo	154	4.2

Sources: Federal Reserve and Government Accountability Office (GAO)

**Table 2 CBLS Borrowing by Foreign Central Banks (in billions of dollars)**

Borrower	Total
European Central Bank	8,011.37
Bank of England	918.83
Swiss National Bank	465.812
Bank of Japan	387.467
Danmarks Nationalbank (Denmark)	72.788
Sveriges Riksbank (Sweden)	67.2
Reserve Bank of Australia	53.175
Bank of Korea (South Korea)	41.4
Norges Bank (Norway)	29.7
Bank de Mexico	9.663

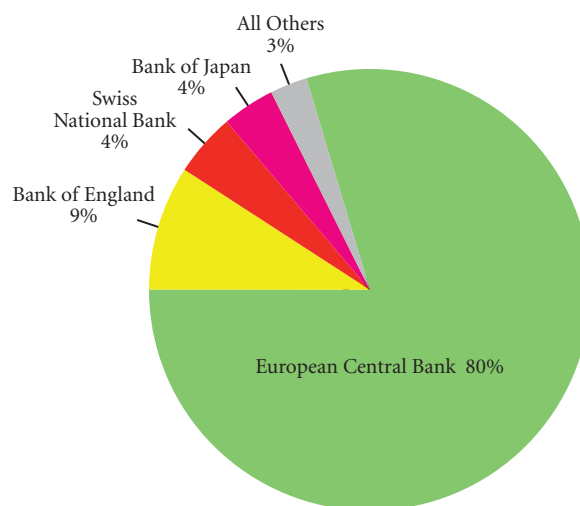
Source: Federal Reserve

aggregate totals, 19 of the 25 largest borrowers were headquartered in foreign countries. The top 25 banks, all of which borrowed in excess of \$47 billion, composed 72 percent of total TAF borrowing. Of the 416 unique participants, 92 percent borrowed more than \$10 billion. Of the \$2,767 billion lent to the top 25 participants, 69 percent (\$1,909.3 billion) went to foreign institutions. The Fed loaned \$3,818 billion in total over the run of this program.

For the TAF, peak monthly borrowing occurred in January 2009 at \$347 billion, while the peak amount outstanding was, in early March 2009, at approximately \$493 billion. The last auction held for this facility occurred on March 8, 2010, with loans maturing on April, 8, 2010. All loans have reportedly been repaid in full, with interest, in agreement with the terms of the facility.

#### Central Bank Liquidity Swap Lines

As an additional response to “pressures in short-term funding markets,” the Fed opened up currency swap lines with foreign

**Figure 3 Borrowing by Foreign Bank Counterparties, December 12, 2007 – July 13, 2010**

Source: Federal Reserve

**Table 3 Top Five ST OMO Participants (in billions of dollars)**

Participant	Total	Percent of All ST OMO Transactions
Credit Suisse (Switzerland)	259.31	30.3
Deutsche Bank (Germany)	101.03	11.8
BNP Paribas (France)	96.50	11.3
RBS Securities (UK)	70.45	8.2
Barclays (UK)	65.55	7.8

Source: Federal Reserve

central banks called Central Bank Liquidity Swap (CBLS) lines (Federal Reserve 2007). With the CBLS facility, two types of credit arrangements were created under the authorization of section 14 of the FRA. Dollar liquidity swaps were arrangements that allowed foreign central banks to borrow dollars against a prearranged line of credit. CBLSs are structured as a repo contract in which the borrowing central bank would sell to the Fed a specified amount of its currency at the exchange rate prevailing in foreign exchange markets. Simultaneously, the participating foreign central bank would agree to buy back its currency on a specified date at the same exchange rate at a market-based rate of interest. The first swap lines were set up in December 2007 with the European Central Bank (ECB) and the Swiss National Bank (SNB). Over the course of the crisis, the Federal Open

Market Committee (FOMC) would also open up liquidity swap lines with numerous other foreign central banks. The facility ran from December 2007 to February 2010 and issued a total of 569 loans.<sup>4</sup> Figure 3 presents the percentage of total borrowing by foreign bank counterparties. Table 2 presents total borrowing by each foreign central bank.

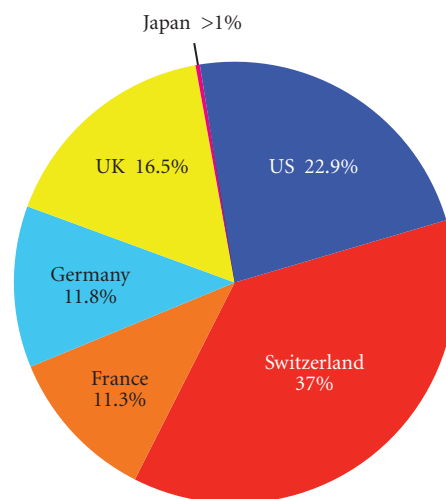
For the CBLS lines, peak monthly lending occurred in October 2008 at \$2.887 trillion. Peak outstanding reached its high in December 2008 at \$583.13 billion, and peak weekly lending occurred in mid-October 2008 at \$851.286 billion. In total, through July 13, 2010, the Fed had lent \$10,057.415 billion to foreign central banks through this program. As of March 1, 2012, all loans have been repaid when due, under the terms and conditions of the swap agreements, and it is expected that all current outstanding loans will be repaid as well.

### Single-tranche Open Market Operations

As it became apparent that existing conventional and nonconventional LOLR operations were failing to adequately allocate liquidity, the Fed announced on March 7, 2008, that it would conduct a series of term repurchase transactions (single-tranche open market operations, or ST OMO) expected to total \$100 billion. These transactions were 28-day repo contracts in which primary dealers posted collateral eligible under conventional open market operations. The Fed is authorized to engage in open market transactions by section 14 of the FRA, and such operations are to be considered a routine part of the Fed’s operating tool kit. However, we have chosen to include these transactions as part of the Fed’s unconventional LOLR response, since their explicit purpose was to provide direct liquidity support to primary dealers. In 375 transactions, the Fed lent a total of \$855 billion dollars. Peak monthly transactions occurred in the months of July, September, and December 2008 at \$100 billion, consistent with the level of lending the Fed had expected. As these transactions were conducted on a schedule; the amount outstanding quickly peaked, on April 30, 2008, at \$80 billion and remained at that level until the facility was discontinued on December 30, 2008. All extant primary dealers participated. Of these 19 institutions, nine were headquartered in foreign countries.

Table 3 presents the five largest program participants, all of which were foreign institutions. Transactions conducted with the five largest participants would comprise 69.4 percent of the program total. As indicated in Figure 4, 77.1 percent (\$657.91 billion) of all transactions were conducted with foreign-based institutions.

**Figure 4 Single-tranche Open Market Operations, by Country, March 7 – December 30, 2008**



Source: Federal Reserve

### Term Securities Lending Facility and TSLF Options Program

To supplement the aid provided to investment banks through the ST OMO and address widening spreads in repo markets that were having an adverse impact on the allocation of liquidity, the Fed announced on March 11, 2008, that it would extend its Treasury securities lending program to “promote liquidity in the financing markets for Treasury and other collateral and thus to foster the functioning of financial markets more generally” (Federal Reserve 2008a). This nonconventional expansion of a conventional program was named the Term Securities Lending Facility (TSLF) and began conducting auctions on March 27, 2008.<sup>5</sup> The Fed instituted a twofold classification scheme for eligible collateral under the TSLF. Schedule 1 collateral was identified as “federal agency debt, federal agency residential-mortgage-backed securities (MBS), and non-agency AAA/Aaa-rated private-label residential MBS” (Federal Reserve 2008a). Schedule 2 included agency collateralized-mortgage obligations and AAA/Aaa-rate commercial mortgage-backed securities, in addition to Schedule 1 collateral. In conjunction to the TSLF, the Fed announced the TSLF Options Program (TOP), to facilitate access to liquidity in funding markets during periods of elevated stress, such as quarter ends, on July 30, 2008. The TOP allowed participants to purchase the right but not the obligation to borrow funds if it became necessary. The TSLF and TOP facilities are important, as they mark the first use by the Fed of the powers given under section 13(3) of the FRA.

Eighteen primary dealers participated in the TSLF program, while only 11 accessed the TOP facility. Of the 18 participants that took part in the TSLF, TOP, or both, eight were foreign institutions. Table 4 presents the five largest TSLF participants, while Figure 5 shows that 51 percent of total borrowing was undertaken by foreign-based institutions. Figure 6 indicates that 86 percent of total borrowing was done by the nine largest program participants.

The week ending September 10, 2008, was the largest in terms of lending (\$110.848 billion) and the week ending October 1 the peak for amount outstanding (\$235.544 billion). The Fed lent \$1,940 billion through the TSLF and another \$62.3 billion under TOP, for a cumulative total of \$2.0057 trillion. All loans are said to have been repaid on time in full, with interest, within the terms of the program.

**Maiden Lane I**

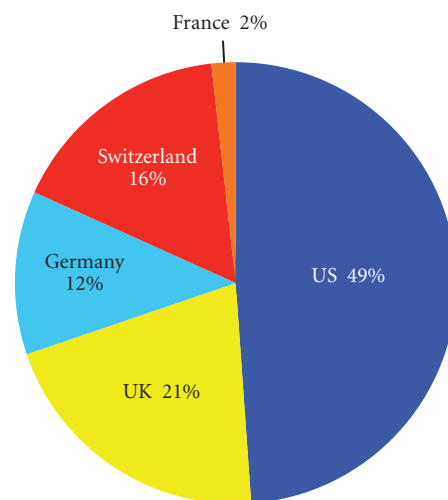
It is also during Stage 1 that the first instance of the Fed offering assistance to a specific institution appears. Throughout early to mid-March 2008, Bear Stearns was experiencing severe funding problems as counterparties refused to enter into transactions with it, even for assets of unquestionable quality. Problems in securing access to liquidity resulted in Bear informing the Fed on March 13 that it would most likely have to file for bankruptcy the following day should it not receive an emergency loan. In an attempt to find an alternative to the outright failure of Bear, negotiations began between representatives from the Fed, Bear Stearns, and JPMorgan. The outcome of these negotiations was announced on March 14, 2008, when the Fed Board of Governors voted to authorize the Federal Reserve Bank of New York (FRBNY) to provide a \$12.9 billion loan to Bear Stearns through JPMorgan Chase against collateral consisting of \$13.8 billion. This bridge loan was repaid on Monday, March 17, with approximately \$4 million in interest. This temporary measure allowed

**Table 4 Top Five TSLF and TOP Participants (in billions of dollars)**

Borrower	Total
Citigroup	348
RBS Securities (UK)	291
Deutsche Bank (Germany)	277
Credit Suisse (Switzerland)	261
Goldman Sachs	225

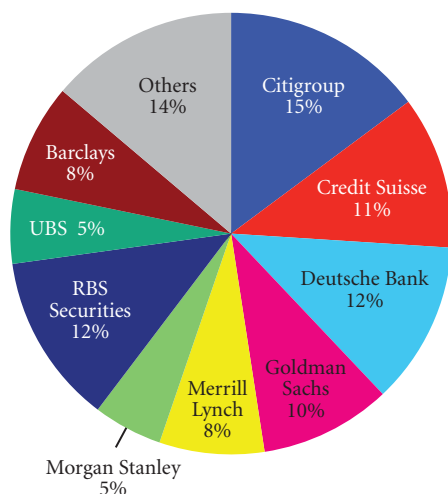
Source: Federal Reserve and GAO

**Figure 5 Institutional TSLF/ TOP Borrowing, by Country, March 27, 2008 – July 16, 2009**



Source: GAO

**Figure 6 TSLF Participation, by Institution, March 27, 2008 – July 16, 2009**



Source: GAO

Bear to continue to operate while courting potential buyers. On March 16, JPMorgan agreed to a provisional merger with Bear Stearns. Subsequent negotiations formulated the structure of JPMorgan’s acquisition of Bear Stearns. The purchase of Bear was accomplished when the FRBNY (\$28.82 billion) and JPMorgan (\$1.15 billion) funded a special-purpose vehicle (SPV), Maiden Lane, LLC (ML I), which purchased Bear’s assets

**Table 5 Top Five PDCF Borrowers (in billions of dollars)**

Borrower	Total
Merrill Lynch	2,081.4
Citigroup	2,020.2
Morgan Stanley	1,912.6
Bear Stearns	960.1
Bank of America	638.9

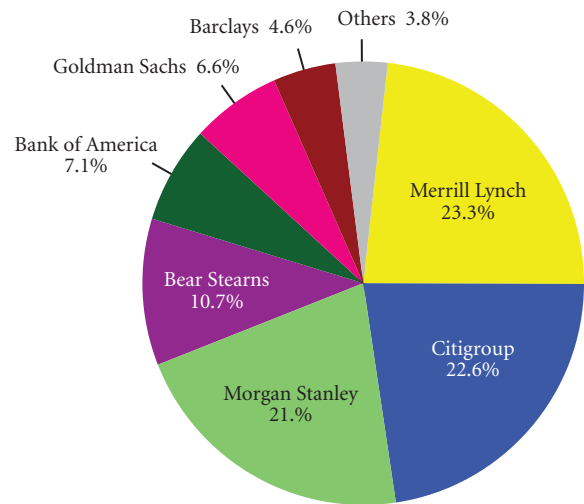
Source: Federal Reserve

for the approximate market value of \$30 billion. Authorization to conduct the transaction was provided by section 13(3) of the FRA. Maiden Lane, LLC, would repay its creditors, first the Fed and then JPMorgan, the principal owed plus interest over 10 years at the primary credit rate beginning in September 2010. The structure of the bridge loan and ML I represent one-time extensions of credit. As such, the peak amount outstanding occurred at issuance of the loans.

**Primary Dealer Credit Facility**

As the Fed endeavored to prevent the disorderly failure of Bear Stearns over the weekend of March 15, it was also laying the groundwork for implementing a standing credit facility to assist primary dealers. The Fed officially announced the Primary Dealer Credit Facility (PDCF) on March 16, 2008, in an attempt to prevent the effects of the Bear Stearns situation from disrupting markets. The PDCF would function essentially as a “discount window for primary dealers” and provide a nonmarket source of liquidity that would ease strains in the repo market (Adrian, Burke, and MacAndrews 2009). Authorized by section 13(3) of the FRA, the PDCF would lend reserves on an overnight basis to primary dealers at their initiative. PDCF credit was secured by eligible collateral, with haircuts applied to provide the Fed with a degree of protection from risk. Initial collateral accepted in transactions under the PDCF were investment-grade securities. Following the events in September of that year, eligible collateral was extended to include all forms of securities normally used in private sector repo transactions. In addition, the Fed approved loans to the UK-based subsidiaries of Goldman Sachs, Morgan Stanley, Merrill Lynch, and Citigroup. The PDCF issued 1,376 loans totaling \$8,950.99 billion. The peak weekly amounts outstanding and lent occurred on September 26, 2008, at \$146.57 billion and \$728.643 billion respectively.<sup>6</sup> Table 5 lists the five largest borrowers from the PDCF.

**Figure 7 PDCF Borrowing, by Institution, March 17, 2008 – May 12, 2009**



Source: Federal Reserve

Figure 7 captures the heavy usage of the PDCF by the largest borrowers. As the graph shows, these borrowers account for 85.1 percent (\$7,610 billion) of the total. The PDCF was closed on February 1, 2010. All loans extended in this facility have been repaid in full, with interest, in agreement with the terms of the facility.

**AIG: Revolving Credit Facility, Securities Borrowing Facility, and Maiden Lane II and III**

In its involvement with American Insurance Group (AIG), the Fed again acted as LOLR to a specific institution. Confronted by the possibility of the voidance of millions of personal and business insurance products, the Fed took steps to ensure AIG’s survival through several targeted measures. To help guarantee AIG enough space to create a viable plan for restructuring, the Fed provided the firm with a revolving credit facility (RCF) on September 16, 2008, which carried an \$85 billion credit line; the RCF lent \$140.316 billion to AIG in total. To assist AIG’s domestic insurance subsidiaries acquire liquidity through repo transactions, a securities borrowing facility (SBF) was instituted. Cumulatively, the SBF lent \$802.316 billion in direct credit in the form of repos against AIG collateral. As a further step in addressing the firm’s problems maintaining liquidity and staving off capital pressures, an SPV, Maiden Lane II, LLC (ML II), was created with a \$19.5 billion loan from the FRBNY to purchase residential MBSs from AIG’s securities lending portfolio. The

**Table 6 Facilities Providing AIG with Assistance (in billions of dollars)**

Facility	Total	Amount Outstanding as of March 1, 2012
RCF	140.316	0
SBF	802.316	0
Maiden Lane II	19.5	2.867
Maiden Lane III	24.3	8.613
Preferred Interests in AIA/ ALICO	25.0	0

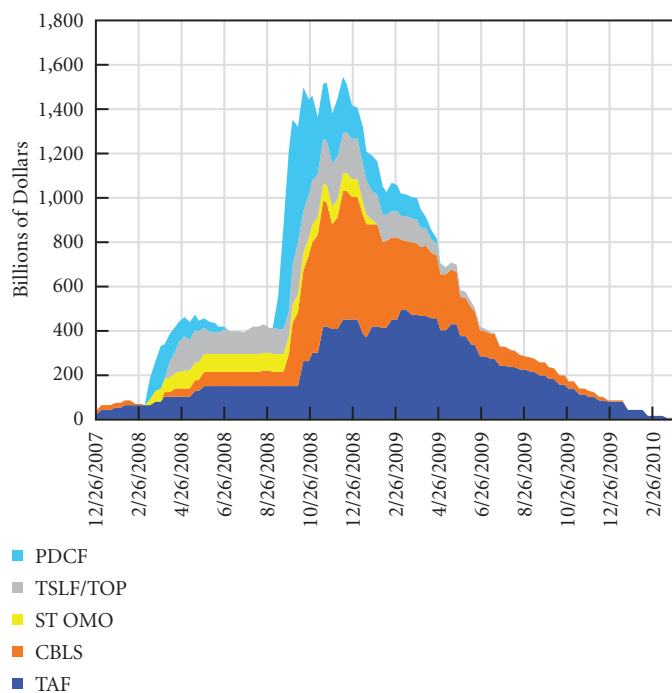
Source: Federal Reserve

proceeds received by AIG in the sale of its residential MBS portfolio were used to repay the SBF and terminate that program. To address the greatest threat to AIG’s restructuring—losses associated with the sizable book of collateralized debt obligations (CDOs) on which it had written credit default swaps (CDSs)—another SPV, Maiden Lane III, LLC (ML III), was funded by an FRBNY loan to purchase AIG’s CDO portfolio. The purchases by ML III totaled \$24.3 billion.

As part of AIG’s divestiture program, the Fed conducted transactions on December 1, 2009, in which the FRBNY received preferred interest in two SPVs created to hold the outstanding common stock of AIG’s largest foreign insurance subsidiaries, American International Assurance Company (AIA) and American Life Insurance Company (ALICO). On September 30, 2010, an agreement was reached between the AIG, the Fed, the US Treasury, and the SPV trustees regarding the AIA/ALICO transactions to facilitate the repayment of AIG’s outstanding obligations to the US government. AIG, the Treasury, and the FRBNY announced the closing of the recapitalization plan announced on September 30, 2010, and all monies owed to the RCF were repaid in full in January 2011. Section 13(3) of the FRA was invoked to conduct each facility providing AIG direct assistance. Table 6 lists the specific total dollar amounts for facilities providing AIG with assistance and the amount outstanding as of March 1, 2012.

Figures 8 and 9 present the total amounts outstanding and lent, respectively, for all Stage 1 programs (these were standing programs, as opposed to one-time extensions of credit). It should be noted that Figures 8 and 9 are stacked area graphs, in which the colored area associated with each facility represents the amount outstanding or lent for the period leading up to the date under consideration for that facility. It should also be stressed

**Figure 8 Stage 1 Amounts Outstanding, December 26, 2007 – April 4, 2010 (in billions of dollars)**



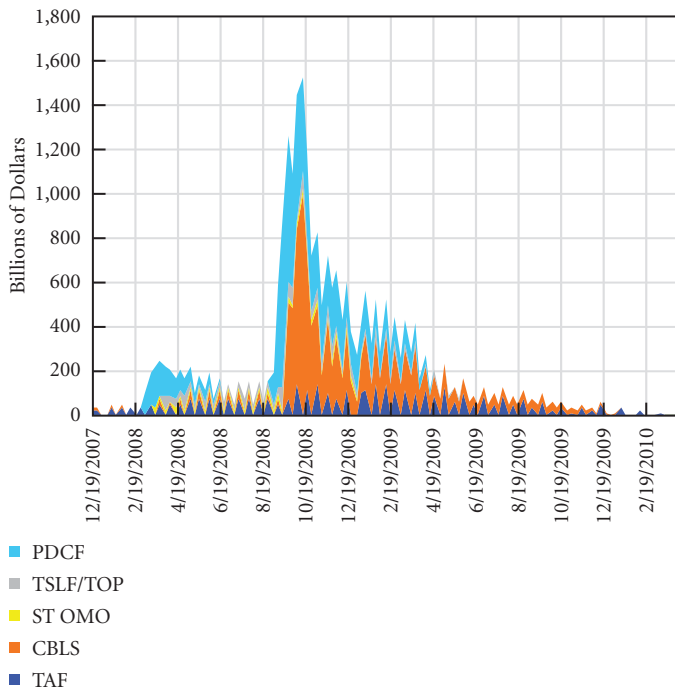
Source: Federal Reserve

that Figure 8 corresponds to stocks, while Figure 9 represents flows. By combining all facilities associated with Stage 1 actions, we are able to determine that the peak amounts outstanding and lent in this stage occurred in late 2008 and early 2009, reaching just under \$1.6 trillion. This is entirely consistent with the fact that this time period represents what might be considered the “worst” of the financial crisis and, as such, elicited significant intervention on the part of the Fed.

### Stage 2: Restarting the Flow of Credit by Provision of Liquidity to Key Credit Markets

The second stage of actions taken by the Fed represents an even larger departure from conventional LOLR operations. The Fed, in an attempt to circumvent the inability (or unwillingness) of financial institutions to engage in the intermediation process, chose to extend direct loans to support what were viewed as critical credit markets. The goal of the Fed in this stage of its efforts was to restart the flow of credit to households and businesses through the institution of programs designed to provide loans to intermediaries who would then purchase debt issued in key financial markets.

**Figure 9 Stage 1 Amounts Lent, December 19, 2007 – March 19, 2010 (in billions of dollars)**



Source: Federal Reserve

### *Asset-Backed Commercial Paper Money Market Mutual Fund Liquidity Facility*

The Fed’s first foray into supporting key credit markets occurred in the aftermath of Lehman Brothers’ bankruptcy. On September 1, 2008, the Reserve Primary Fund, the oldest money market mutual fund (MMMF) in the United States, lowered its share price below \$1 and “broke the buck.” As a response to the uncertainty regarding the value of positions in MMMFs, investors scrambled to withdraw funds. During the week of September 15, investors withdrew \$349 billion. The total withdrawn in the following three weeks amounted to an additional \$85 billion (FCIC 2011, 357). To meet withdrawal requests, many mutual funds were forced to sell assets, triggering increased downward pressure on asset prices. The creation of the Asset-Backed Commercial Paper Money Market Mutual Fund Liquidity Facility (AMLF) was an attempt to forestall the liquidation of assets by funds, and therefore prevent further deflation in asset prices. The Fed responded to this series of events with a facility targeting the MMMF market.

The AMLF was designed to extend nonrecourse loans to intermediary borrowers at the primary credit rate. On the same

**Table 7 Top Five Buyers of ABCP under AMLF Program (in billions of dollars)**

Parent Company	Total	Percent of All ABCP Purchases
JPMorgan Chase	111.4	51.2
State Street Bank and Trust Company	89.2	41.1
Bank of New York Mellon	12.9	5.9
Bank of America	1.6	0.7
Citigroup	1.4	0.7

Source: Federal Reserve

day the AMLF loan was issued, intermediaries used these funds to purchase high quality asset-backed commercial paper (ABCP) issued by MMMFs. The indirect process adopted was necessitated by “statutory and fund-specific limitations,” which prevented the MMMFs from borrowing directly from the Fed. The primary intention of the AMLF was to allow MMMFs to fund themselves by issuing ABCP to be purchased by intermediaries, with the larger goal of the program being to provide liquidity in the broader money markets (Federal Reserve 2009a, 53). The AMLF was announced on September 19, 2008, and executed by the Federal Reserve Bank of Boston (FRBB). All loans were fully collateralized, and borrowers and intermediaries were subject to eligibility requirements. To ensure that the AMLF was being used in accordance with its stated purpose, the Fed would later require MMMFs to provide proof of material outflows prior to selling ABCP under the AMLF program (Federal Reserve 2009b). The authorization for the AMLF program would again come from section 13(3) of the FRA.

Two institutions, JPMorgan Chase and State Street Bank and Trust Company, constituted 92 percent of AMLF intermediary borrowing; see Table 7. Over the course of the program, the Fed would lend a total of \$217.435 billion. Peak weekly lending reached its apex the week of September 25, 2008, at \$88.6 billion, and the peak amount outstanding, \$152.1 billion, was reached on October 2, 2008.

The nine largest sellers of ABCP are listed in Table 8. Funds selling in excess of \$10 billion composed roughly 58 percent of overall ABCP sales. All loans have reportedly been repaid in full, with interest, in agreement with the terms of the facility. The AMLF was closed on February 1, 2010.



**Table 8 Top Sellers of ABCP under AMLF Program (in billions of dollars)**

Fund Family Seller	Total	Percent of All ABCP Sales
Reserve Funds	19	8.9
JPMorgan Chase	18	8.1
Dreyfus	17	7.6
Columbia Funds	15	6.9
Barclays	13	5.9
Wells Fargo	12	5.6
BlackRock	12	5.5
Federated	10	4.7
Morgan Stanley	10	4.4
All Others	92.01	42.4

Source: Federal Reserve

**Table 9 Top 10 CPFF Borrowers (in billions of dollars)**

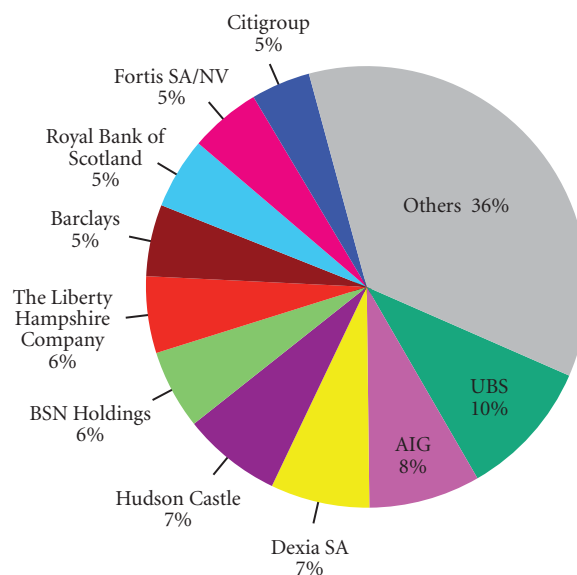
Borrower	ABCP	Unsecured CP	Issuer Total	Percent of CPFF Total
UBS (Switzerland)	0	74.5	74.5	10.1
AIG	36.0	24.0	60.2	8.2
Dexia SA (Belgium)	0	53.5	53.5	7.3
Hudson Castle	53.3	0	53.3	7.2
BSN Holdings (UK)	42.8	0	42.8	5.8
The Liberty Hampshire Company	41.4	0	41.4	5.6
Barclays (UK)	0	38.8	38.8	5.3
Royal Bank of Scotland (UK)	24.8	13.7	38.5	5.2
Fortis Bank SA/NV	26.9	11.6	38.5	5.2
Citigroup	12.8	19.9	32.7	4.3

Source: Federal Reserve

### Commercial Paper Funding Facility

Despite providing support to the MMMFs through the AMLF so as to prevent redemption requests from having a disruptive effect on debt markets, MMMFs showed little inclination to resume their purchases of commercial paper (CP). Uncertain about counterparty credit risk and their own liquidity risk, MMMFs shifted their portfolios toward more secure assets, such as US Treasuries (Anderson and Gascon 2009). As a consequence of the “flight to safety” by market participants, credit markets essentially “froze up,” stalling the flow of credit to households and businesses. To address this disruption, the Fed announced

**Figure 10 CPFF Borrowing, by Institution, October 27, 2008 – January 25, 2010**



Source: GAO

the Commercial Paper Funding Facility (CPFF) on October 7, 2008. This facility was authorized under section 13(3) of the FRA and was designed to improve liquidity in CP markets. The program was structured to operate through an SPV since the CPFF’s logistics fell outside the Fed’s traditional operating framework. The SPV provided assistance by purchasing highly rated ABCP and unsecured US dollar-denominated CP of three month maturity from eligible issuers. To manage credit risk the Fed attached fees to program participation, collecting \$849 million from program participants, according to the Fed’s website.

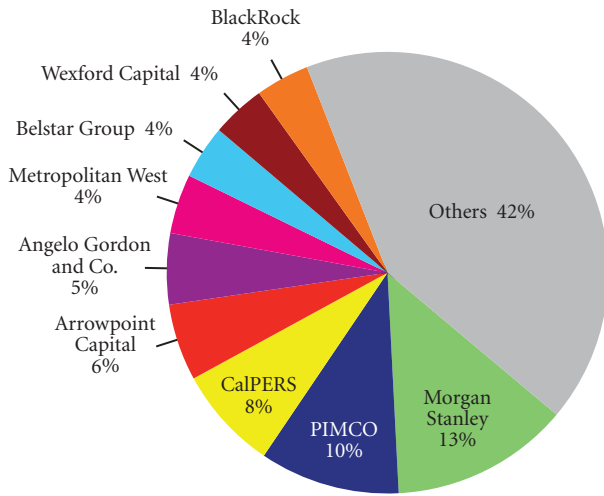
A total of 120 unique institutions took part in this facility. The top 10 borrowers (each borrowing in excess of \$30 billion) account for 64.3 percent (\$473.9 billion) of all borrowing—see Table 9 and Figure 10. The cumulative total lent under the CPFF was \$737.07 billion. Peak lending occurred during the first week of operations at \$144.59 billion, and the largest amount outstanding occurred on January 22, 2009, at \$348.176 billion. The CPFF was suspended on February 1, 2010, and all loans are said to be paid in full under the terms and conditions of the program.

### Term Asset-Backed Securities Loan Facility

Despite the CPFF and AMLF being implemented to improve conditions in credit markets, pervasive uncertainty resulted in rising credit standards. At the time, it was believed that upward

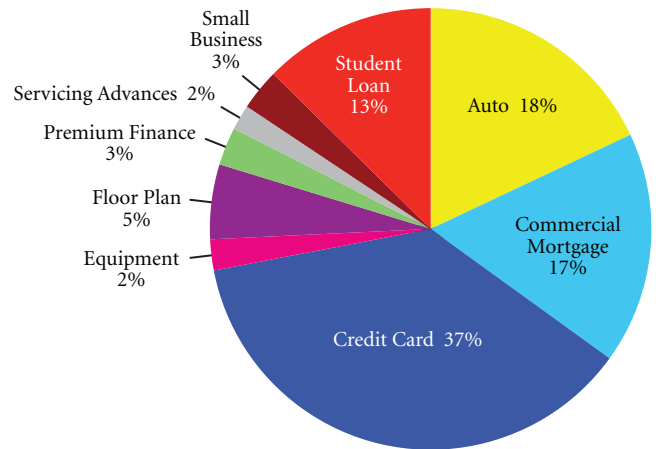


**Figure 11 TALF Borrowing, by Institution, March 25, 2009 – March 29, 2010**



Sources: GAO and Federal Reserve

**Figure 12 TALF Lending by Asset Category, March 25, 2009 – March 29, 2010**



Source: Federal Reserve

**Table 10 Top Five TALF Borrowers (in billions of dollars)**

Borrower	Total
Morgan Stanley	9.3
PIMCO	7.3
CalPERS	5.4
Arrowpoint Capital	4.0
Angelo Gordon and Co.	3.7

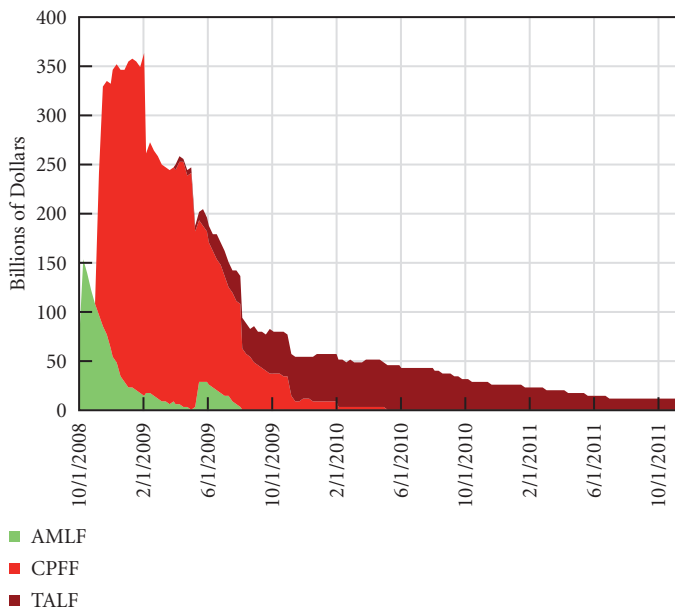
Source: GAO

of 70 percent of banks tightened standards (Federal Reserve 2009c, 8). Financial innovation in the credit intermediation process over the 20 years preceding the crisis had resulted in the development of an “originate and distribute” model in which pools of loans were packaged by lenders and sold as fixed-income products. The sale of securitized ABS products allowed lenders to move long-term (and illiquid) loans off their balance sheets and, in the process, collect immediate profits and funding with which to make new loans. To confront gridlock in ABS markets, and to increase the flow of credit throughout the US economy, the Fed announced the creation of the Term Asset-Backed Securities Loan Facility (TALF) on November 25, 2008. Operating similarly to the AMLE, the TALF provided nonrecourse loans to eligible borrowers posting eligible collateral, but for terms of five years. Borrowers would then act as an intermediary, using the

TALF loans to purchase ABSs. These ABSs were required to have received a credit rating in the highest investment-grade category by two approved ratings agencies and would serve as collateral for the TALF loan. The ABS categories eligible for issuance under the TALF included: auto loans, student loans, credit card loans, equipment loans, “floor plan” loans, insurance premium finance loans, small-business loans fully guaranteed by the US Small Business Association, servicing advance receivables, and commercial mortgage loans. Authorization to conduct the TALF was provided under section 13(3) of the FRA.

Although the Fed terminated lending under the TALF on June 30, 2010, loans remain outstanding under the program until March 30, 2015. The Fed loaned in total \$71.09 billion through this program. Significantly smaller in size than other emergency lending programs, the TALF’s peak in terms of amount lent occurred the weeks beginning June 4, 2009, at \$10.72 billion, and after suspending operations, the amount outstanding peaked at \$48.19 billion on March 18, 2010. Of the 177 borrowers, those borrowing over \$2 billion constituted 58 percent (\$41.24 billion) of total borrowing; see Figure 11. The top five largest borrowers are depicted in Table 10, and compose 41.7 percent (\$29.7 billion) of total borrowing. Figure 12 presents the allocation of TALF loans by asset category. As of March 1, 2012, over 10 percent of loans (\$7.569 billion) remained outstanding. No collateral has yet to be surrendered due to default on payments.

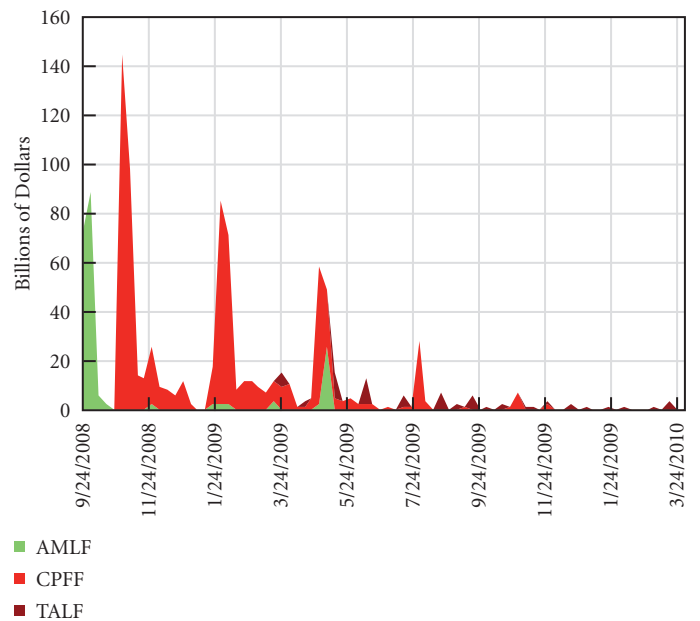
**Figure 13 Stage 2 Amounts Outstanding, October 1, 2008 – November 9, 2011 (in billions of dollars)**



Source: Federal Reserve

Figures 13 and 14 present the total amounts outstanding and lent, respectively, for all Stage 2 programs. Again, the use of stacked line graphs in Figures 13 and 14 allows us to identify two major characteristics of the Stage 2 programs. Representing a departure from the provision of liquidity associated with Stage 1, the programs in Stage 2 are identified with a significant transformation in the Fed’s crisis policy stance. As Stage 1’s temporary “running” facilities were wound down, Stage 2 facilities provided funding that allowed intermediaries to purchase liabilities issued in what the Fed viewed as “key financial markets.” Figure 13 clearly shows that the CFFF was by far the largest of the Stage 2 facilities, but it is important to note that the figure of approximately \$350 billion associated with the peak amount outstanding needs to be interpreted with care. Since the PDCF made “overnight” loans to primary dealers, the peak total mentioned above reflects only the amount outstanding arising from transactions undertaken the day before the close of the Fed’s weekly reporting period: the daily peak amount outstanding may be considerably larger. This is an issue that we plan to address in later reports. A second characteristic captured by Figure 13 is that Stage 2 facilities were significantly smaller, in dollar terms,

**Figure 14 Stage 2 Amounts Lent, September 24, 2008 – March 31, 2010 (in billions of dollars)**



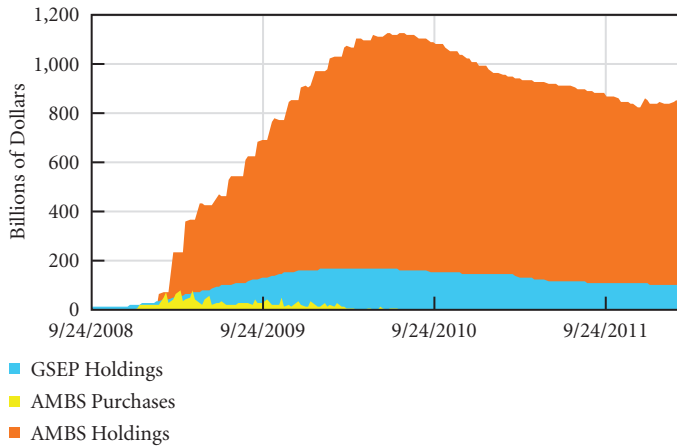
Source: Federal Reserve

than those associated with Stage 1. Indeed, they amount to just around a quarter of the size of Stage 1.

### Stage 3: Purchases of Medium- and Long-Term Securities

The final stage of the Fed’s response is composed of the purchase of long-term securities in an attempt to further support the functioning of credit markets (Bernanke 2009). Policy actions associated with this stage are the purchase of the direct obligations of housing-related government-sponsored entities (GSEs) and GSE-backed MBSs, as well as subsequent rounds of quantitative easing, the latter of which, while unconventional, is well known in monetary policy theory and in practice (e.g., the Bank of Japan’s monetary policy from the 1990s onward). Stage 3 programs involve the “expansion of traditional open market operations support to the functioning of credit markets through the purchase of long-term securities for the Fed’s portfolio” (Federal Reserve 2011b). As the purchase of Treasuries represents a weapon from the monetary policy arsenal and therefore is not associated with LOLR operations, we will consider only the Fed’s purchase of MBSs in this section.

**Figure 15 Weekly MBS Purchases and Amounts Outstanding, September 24, 2008 – March 1, 2012 (in billions of dollars)**

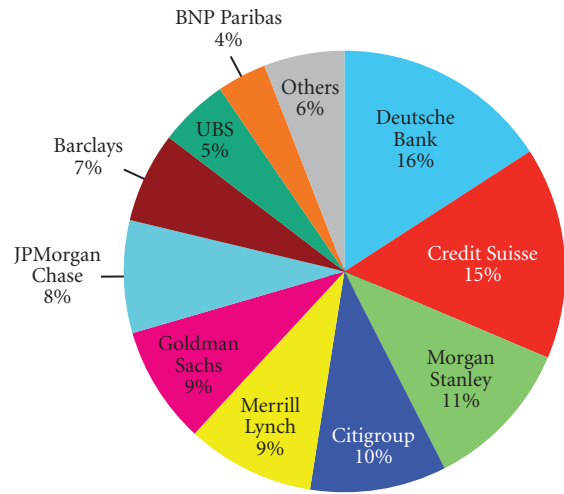


Source: Federal Reserve

**Government Sponsored Entity Direct Obligation Purchase Program (GSEP)**

During the first half of 2008 it became increasingly apparent that problems emerging in the subprime mortgage market could not be contained without adversely affecting the market for more conventional mortgages and the housing market in general. Leading up to the financial crisis, GSEs were by far the largest players in the mortgage market, guaranteeing approximately \$5.3 trillion in loans. Moreover, GSEs were highly leveraged, operating with extremely low levels of capital (FCIC, 309). As the crisis in the subprime sector worsened, investors were highly concerned about the solvency of GSEs. This concern manifested itself in greater funding costs for GSEs as spreads between their direct obligations and that of US Treasury debt increased. In an attempt to increase the availability of credit and reduce costs to potential homebuyers (or those refinancing existing mortgages), the Fed announced on November 25, 2008, that it would begin purchasing the direct obligations of GSEs. Initially, this program was slated to buy up to \$100 billion in GSE direct obligations; however, this amount was increased to \$200 billion on March 18, 2009. Figure 15 shows that the peak holdings of agency debt occurred in March 2010 at \$160.011 billion, a number consis-

**Figure 16 Sales to MBS Program, by Institution (in billions of dollars)**



Source: Federal Reserve

**Table 11 Top Five Sellers to MBS Program (in billions of dollars)**

Seller	Total
Deutsche Bank	293.325
Credit Suisse	287.26
Morgan Stanley	205.71
Citigroup	184.95
Merrill Lynch	173.57

Source: Federal Reserve

tent with the Fed Open Market Committee’s September 2009 decision to slow purchases. As of March 1, 2012, the Fed’s portfolio contained \$100.817 billion in GSE obligations.

**Agency Mortgage-Backed Securities Purchase Program**

The Agency Mortgage-Backed Securities Purchase Program (AMBS) was authorized by section 14 of the FRA. It was created to stabilize the price of MBSs, as well as to “increase the availability for credit for the purchase of houses, which in turn should support housing markets and foster improved conditions in financial markets more generally” (Federal Reserve 2008b). As of July 2010, the Fed had purchased some \$1,850.14 billion in MBSs via open market operations conducted by the FRBNY. However, as the Fed was making purchases, it was simultaneously

conducting sales—with net MBS purchases by the Fed at \$1,250 billion. Figure 15 indicates that the Fed’s MBS holdings peaked at \$1,128.67 billion on June 23, 2010. The highest weekly purchases occurred for the week beginning April 12, 2009, when the Fed made gross purchases of \$80.5 billion. All transactions were conducted with primary dealers for MBSs of three maturities: 15, 20, and 30 years—with the purchase of 30-year MBSs making up 95 percent of total purchases.

Table 11 presents the top five sellers of MBSs to the Fed under this program: Deutsche Bank Securities, Credit Suisse, Morgan Stanley, Citigroup, and Merrill Lynch. Figure 16 shows that these sellers accounted for 61 percent (\$1.145 trillion) of total MBS purchases. Of the 16 program participants, the nine foreign primary dealers constituted over half (52 percent) of MBS sellers, or \$964.53 billion. This relationship is expressed in Figure 17.

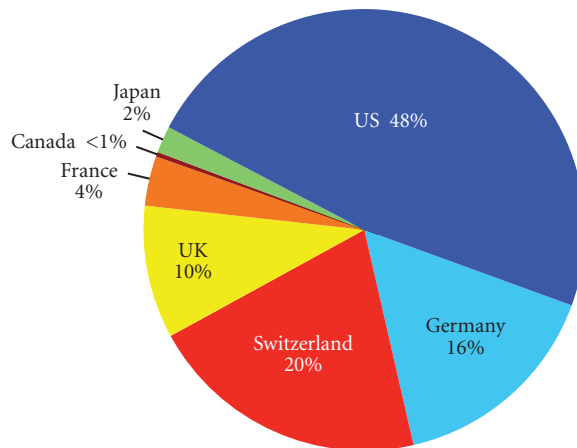
### Aggregated Results

When all individual transactions are summed across all unconventional LOLR facilities, the Fed’s response totaled \$29,616.4 billion dollars. Note that this includes direct lending plus asset purchases. Table 12 and Figure 18 depict the cumulative amounts for all facilities; any amount outstanding as of March 1, 2012, is in parentheses below the total in Table 12. Three facilities—CBLS, PDCE, and TAF—would overshadow all other unconventional LOLR programs, and make up 77.1 percent (\$22,826.8 billion) of all assistance.

With reference to aggregate peak totals for the amounts outstanding and lent, respectively, the dates on which these occurred were December 10, 2008, at \$1,716.63 billion, and October 15, 2008, at \$1,864.16 billion. The latter date and amount clearly reflect the disruptions manifested in financial markets due to problems associated with Lehman and AIG. While the former is simply the stocks accrued as a result of the Fed’s actions, the latter is represented by flows (in terms of reserve balances created) to address the disruptions.

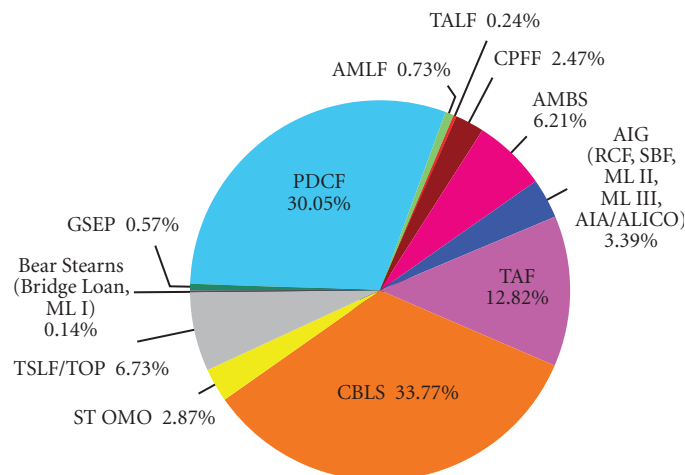
The cumulative total for individual institutions provides even more support for the claim that the Fed’s response to the crisis was truly of unprecedented proportions and was targeted at the largest financial institutions in the world. If the CBLs are excluded, 83.9 percent (\$16.42 trillion) of all assistance would be provided to only 14 institutions. Table 13 and Figure 19 display the degree to which a few very large institutions received the

**Figure 17 MBS Purchases, by Country**



Source: Federal Reserve

**Figure 18 Total Federal Reserve Crisis Response, by Facility**



Source: Federal Reserve

preponderance of support from the Fed. To stress the extent of borrowing by these institutions, we note that the six largest institutions presented in Table 13 account for over half (53.5 percent) of the total Fed response, excluding loans made to foreign central banks under the CBLs. Moreover, the six largest foreign-headquartered institutions listed in Table 13 account for almost a quarter (23.4 percent) of total lending when the CBLs are excluded.

**Table 12 Cumulative Facility Totals (in billions of dollars)**

Facility	Total	Percent of Cumulative Totals
Term Auction Facility	3,818.41	12.82
Central Bank Liquidity Swaps	10,057.4 (107.763)	33.77
Single-tranche Open Market Operation	855	2.87
Terms Securities Lending Facility and Term Options Program	2,005.7	6.73
Bear Stearns Bridge Loan	12.9	0.04
Maiden Lane I	28.82 (3.265)	0.10
Primary Dealer Credit Facility	8,950.99	30.05
Asset-backed Commercial Paper Money Market Mutual Fund Liquidity Facility	217.45	0.73
Commercial Paper Funding Facility	737.07	2.47
Term Asset-backed Securities Loan Facility	71.09 (7.569)	0.24
Government Sponsored Entity Direct Obligation Purchase Program	169.011 (100.817)	0.57
Agency Mortgage-Backed Security Purchase Program	1,850.14 (849.26)	6.21
AIG Revolving Credit Facility	140.316	0.47
AIG Securities Borrowing Facility	802.316	2.69
Maiden Lane II	19.5 (2.867)	0.07
Maiden Lane III	24.3 (8.613)	0.08
AIA/ALICO	25	0.08
<b>Total</b>	<b>29,785.14</b>	<b>100.0</b>

Note: Figures in red indicate amounts outstanding as of November 10, 2011.

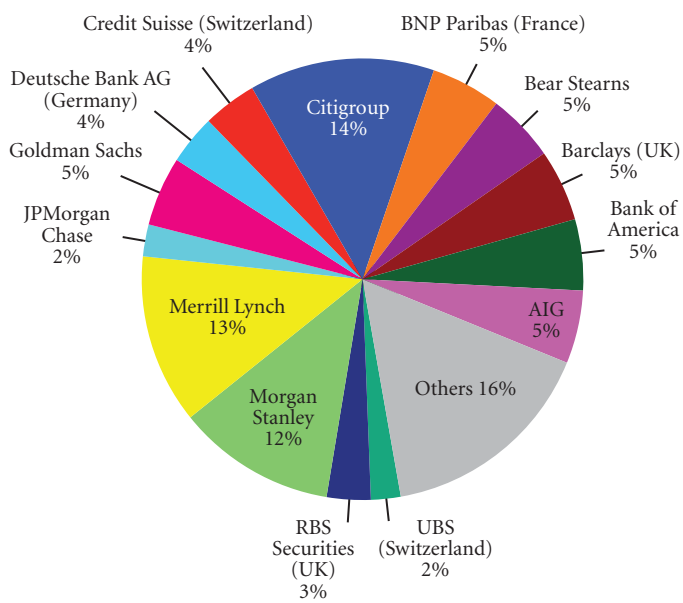
Source: Federal Reserve

**Conclusion**

This brief has focused on the Federal Reserve’s response to the 2007–09 global financial crisis as it acted to preserve the largest financial institutions. We will never know what might have happened had there not been such a strong intervention. The best we can do is study the methods through which central banks prevented what might have been financial Armageddon. This brief makes an initial attempt at doing just that.

This is the first of what we intend to be a series of reports on the Fed’s efforts. In this one, we have focused on an accounting of the funds spent, by facility. We have also tallied how much the largest institutions received. Finally, we have indicated where foreign institutions have received substantial help, including foreign central banks as well as private banks. In subsequent reports we will provide more detail on some of the Fed’s actions, and will also

**Figure 19 Total Institutional Participation, excluding CBLS, December 12, 2007 – July 13, 2010**



Source: Federal Reserve

**Table 13 Largest Bailout Participants, excluding CBLS (in billions of dollars)**

Participant	Total	Percent of All Funding
Citigroup	2,654.0	13.6
Merrill Lynch	2,429.4	12.4
Morgan Stanley	2,274.3	11.6
AIG	1,046.7	5.4
Barclays (UK)	1,030.1	5.3
Bank of America	1,017.7	5.2
BNP Paribas (France)	1,002.2	5.1
Goldman Sachs	995.2	5.1
Bear Stearns	975.5	5.0
Credit Suisse (Switzerland)	772.8	4.0
Deutsche Bank (Germany)	711.0	3.6
RBS Securities (UK)	628.4	3.2
JPMorgan Chase	456.9	2.3
UBS (Switzerland)	425.5	2.2
All Others	3,139.3	16.1
<b>Total</b>	<b>19,559.00</b>	<b>100.0</b>

Source: Federal Reserve

discuss implications concerning such matters as the risk of losses to the Fed and Treasury due to the Fed's expenditures, as well as matters related to congressional oversight and Fed accountability.

### Acknowledgments

We would like to thank the Ford Foundation for their generous support, Nicola Matthews for her assistance in preparing the data, and Devin Rafferty for assistance with double-checking calculations.

### Notes

1. With the passage of the Dodd-Frank Act in 2010, the Fed must now make extraordinary crisis measures "broad based." What, exactly, "broad based" connotes remains to be seen.
2. See Bernanke 2009 or Sarkar 2009 for an account of this classification scheme.
3. Many, including the Fed, believe that discount window borrowing attaches a "stigma" to the borrower. Evidence of its usage is often interpreted as a position of financial weakness, and may result in additional pressures from creditors or an inability to find counterparties.
4. It should be noted that on June 29, 2011, the Fed extended the swap lines through August 1, 2012 (Federal Reserve 2011a). As of March 1, 2012, \$107.763 billion remained outstanding.
5. It needs to be noted that the Fed routinely engages in overnight lending of Treasury securities. Following the Fed's lead, we include transactions undertaken as part of the TSLF as part of the Fed's crisis response.
6. Since the PDCF issued overnight loans, the amount outstanding reflects only loans for one day, while the amount lent includes the total of loans for a week.

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