Financial Turmoil and the Economy

Economic Research

Economic Research, the other areas contributing to this report, and the Legal department are part of an interdepartmental committee the Federal Reserve Bank of San Francisco formed in 2008 to coordinate responses at the highest levels to the crisis. The initial focus on the fallout in the housing and mortgage markets now has expanded to encompass the broader financial crisis. The committee coordinates individual department initiatives and interdepartmental initiatives to address challenges and analyze emerging developments and policy issues related to housing, financial markets, and financial institutions.

Seated (Left to Right): Simon Kwan, John Krainer, Jose Lopez
Standing (Left to Right): Jens Christensen, Fred Furlong, Liz Laderman

The year 2008 marked a watershed for the modern global financial system and presented the Federal Reserve with some of the greatest challenges in its history. The financial market turmoil that started in the previous year worsened substantially during 2008, and its effect on real economic activity was substantial. Facing the mutually reinforcing combination of the most serious impairment of our financial system and the potentially worst economic downturn since World War II, the Federal Reserve took unprecedented actions as it strived to restore economic growth, job creation, and financial stability, as well as to preserve price stability, an effort that continues in 2009 (see Box 1: Financial Crisis Timeline).

The intensification of the turmoil in financial markets in 2008 was due in part to the marked deterioration in conditions in the housing and residential mortgage markets. As documented in last year's annual report, *The Subprime Mortgage Market: National and Twelfth District Developments*, the end of the credit and housing boom in the second half of 2005 unveiled earlier excesses that eventually led to the swelling of mortgage delinquencies and the eruption of financial market turmoil in August of 2007. In 2008, amid the steepening of house-price depreciation, the economy weakened substantially and the number of mortgage delinquencies climbed even higher.

The buildup of financial stress in 2008 extended far beyond the housing and the residential mortgage markets. In the earlier boom years, asset values in general were inflated in an environment of unusually low risk spreads, heightened reliance on financial leverage, and the proliferation of complex and opaque financial instruments that proved to be fragile under stress. As market forces corrected these excesses, the simultaneous re-pricing of risks, deleveraging, and

During the year, the loss of confidence led to serious impairment and, in some cases, a freezing up of credit flows in key markets.

massive write-downs by financial institutions unleashed powerful forces across financial markets in 2008.

Market Participants Lose Confidence

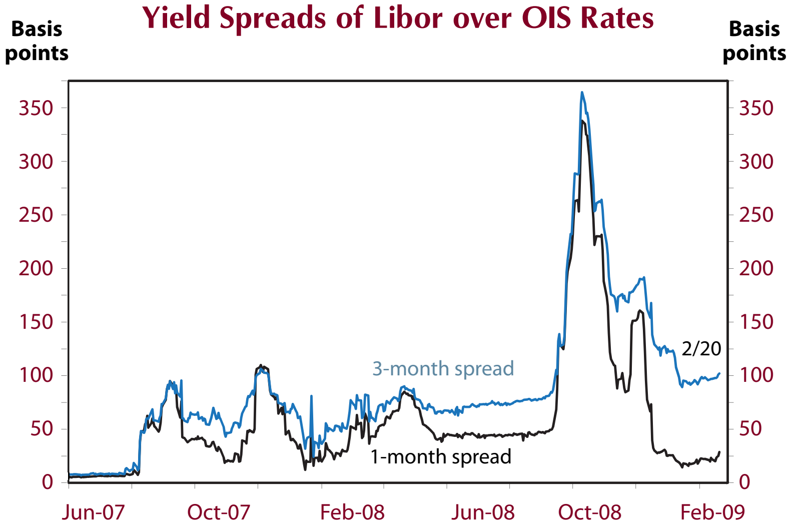
Resolution of the financial crisis is complicated by a profound loss of investor and public confidence in the strength of key financial markets and institutions. The loss of confidence stems in part from uncertainty about the extent of potential financial losses in the face of deteriorating economic conditions and the difficulty of valuing complex financial securities. Confidence is further undermined by the limited disclosure by financial institutions on their portfolio compositions and asset holdings, which makes it difficult to assess their exposure to losses. Many of these institutions are especially vulnerable owing to their very high leverage and heavy reliance on very short-term funding.

During the year, the loss of confidence led to serious impairment and, in some cases, a freezing up of credit flows in key markets. One notable example is the term interbank market—that is, the market in which banks lend to each other for periods longer than overnight. Due to concerns about the ability of borrowers in the interbank market to repay loans and the desire of banks to protect their own capital and liquidity positions, the spreads on term interbank borrowing rates relative to the Overnight Index Swap (OIS) rates—a key measure of funding stress—spiked to uncharted territory following several high profile events during 2008, such as the forced sale of Bear Stearns and the bankruptcy of Lehman Brothers (see Chart 1).[1] Other examples of credit market impairment during the year included the sharp slowdown of commercial

Serious impairment of the term interbank funding market

Chart 1

Yield Spreads of Libor over OIS Rates

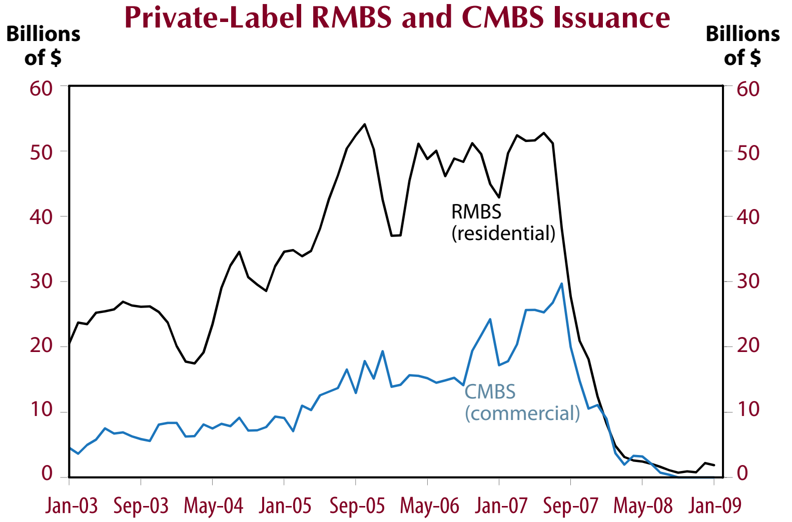


Libor: London interbank offered rate

Private-label mortgage securitization evaporates

Chart 2

Private-Label RMBS and CMBS Issuance



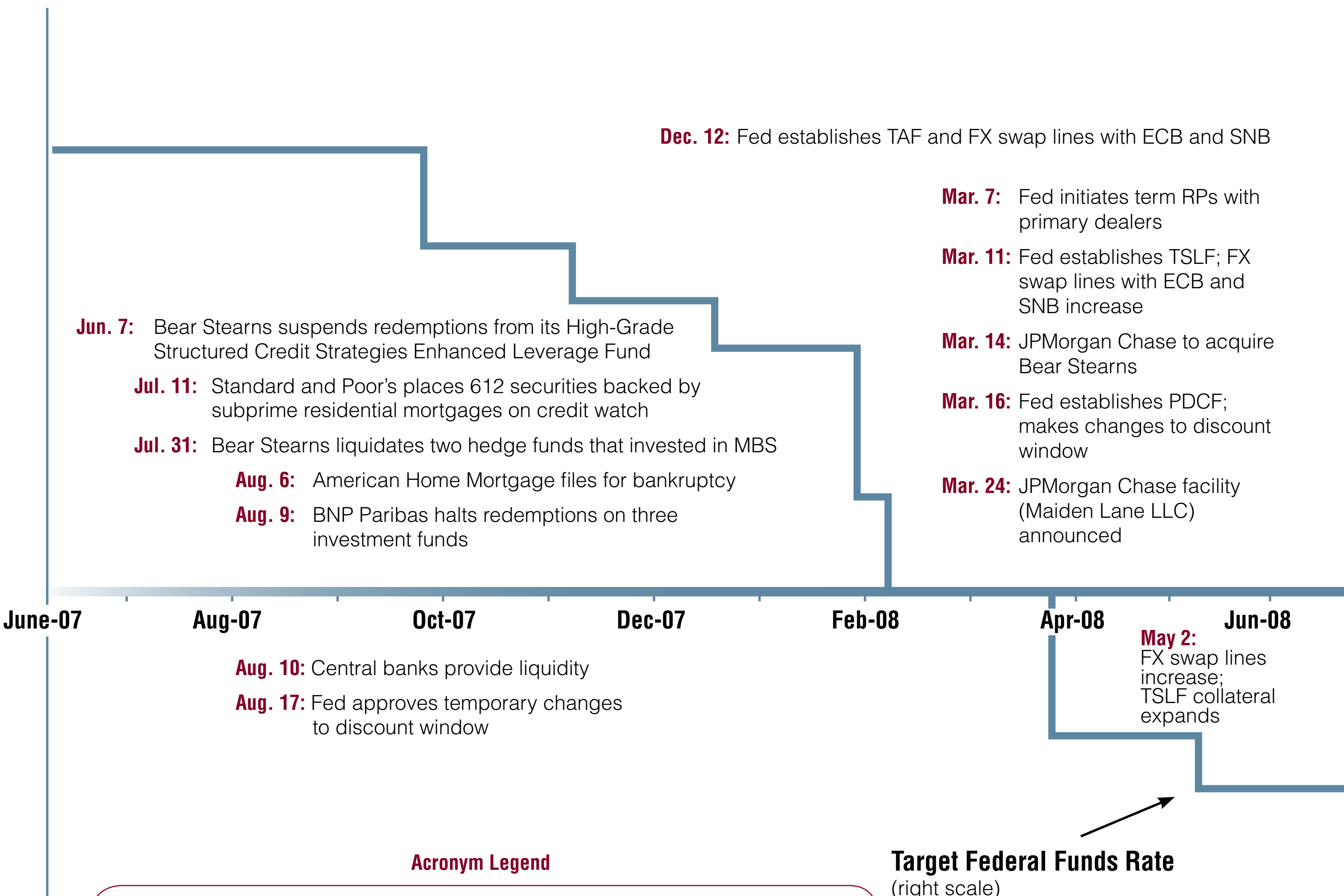
1 *The OIS rate is the fixed leg underlying the derivative contract between two parties swapping overnight federal funds with term federal funds.*

paper issuance after a prominent money market fund "broke the buck"—when its share value fell below one dollar—and the elevated risk spreads on mortgage-backed securities (MBS) that are guaranteed by the two government-sponsored enterprises (GSEs), Fannie Mae and Freddie Mac, even after they were placed in conservatorship by the federal government.

Household and Business Credit Stifled

The impairment of financial markets severely stifled credit flows to households and businesses. Issuance of private-label MBS, both for residential and commercial mortgages, essentially evaporated (see Chart 2), and the securitization of consumer and business-related loans

Box 1: **Financial Crisis Timeline: Federal Funds Target Rate and Other Policy Actions**

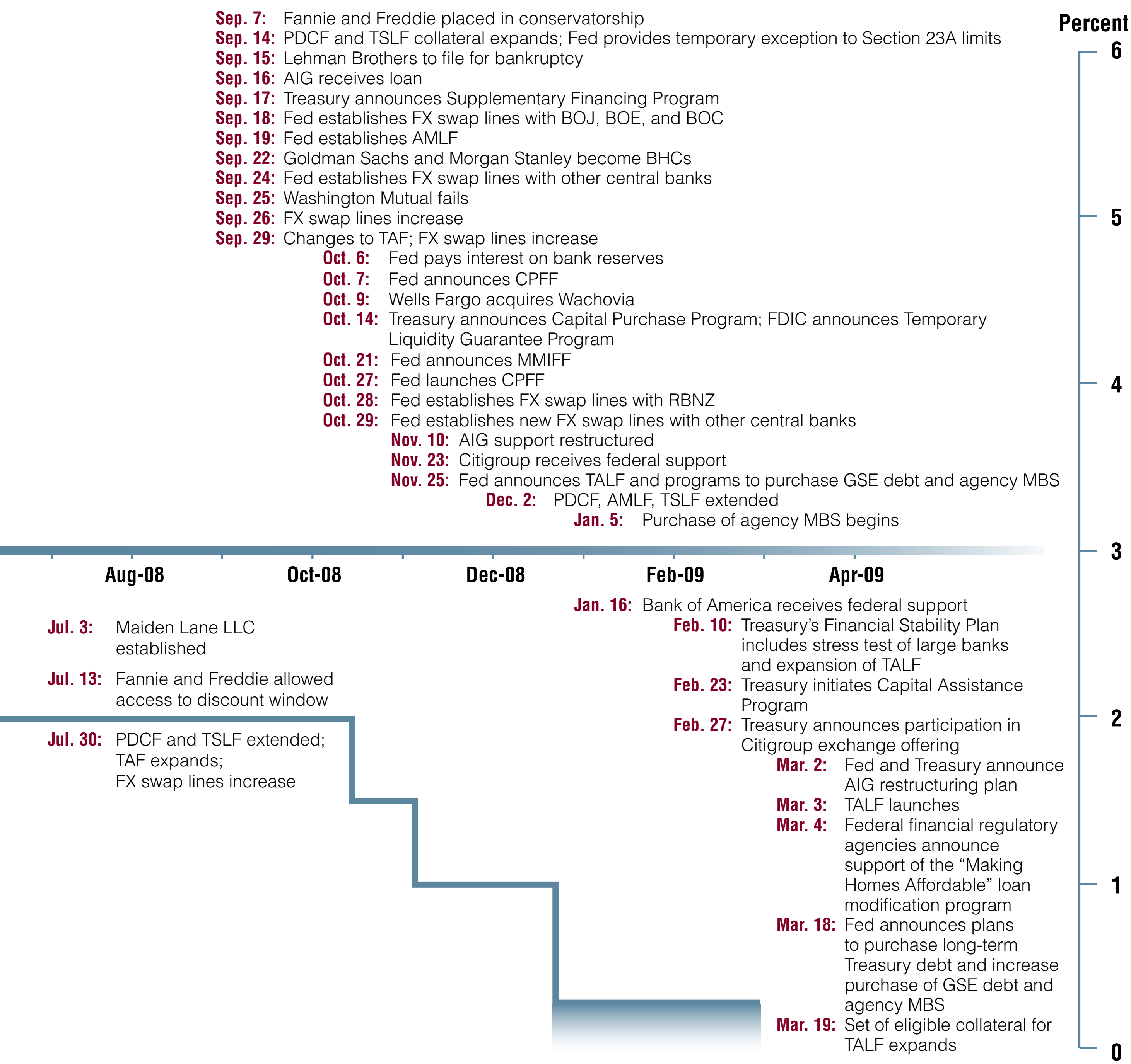


Acronym Legend

Asset-Backed Commercial Paper Money Market Fund Liquidity Facility (AMLF)
Bank holding company (BHC)
Bank of Canada (BOC)
Bank of England (BOE)
Bank of Japan (BOJ)
Commercial Paper Funding Facility (CPFF)
European Central Bank (ECB)
Foreign exchange (FX)
Government-Sponsored Enterprise (GSE)
Limited Liability Corporation (LLC)
Money Market Investor Funding Facility (MMIFF)
Mortgage-backed securities (MBS)
Primary Dealer Credit Facility (PDCF)
Reserve Bank of New Zealand (RBNZ)
Repurchase agreements (RPs)
Swiss National Bank (SNB)
Term Asset-Backed Securities Loan Facility (TALF)
Troubled Asset Relief Program (TARP)
Term Auction Facility (TAF)
Term Securities Lending Facility (TSLF)

nose-dived. Commercial banks also severely tightened credit terms and lending standards during 2008. Although lending by commercial banks expanded in 2008, the expansion did not offset contractions in other sources of private funding. On net, credit availability to households and businesses was exceptionally tight.

Our economic system is critically dependent on well-functioning financial markets and sound financial institutions that mediate the flow of credit. The impairment of financial markets and credit flows took a heavy toll on the economy. With the United States officially in a recession during all of 2008, the economy lost about 2.6 million jobs, the worst 12-month period since World War II. This created an adverse feedback



loop—that is, economic deterioration intensified stress in the financial sector, which in turn further squeezed economic activity, creating a mutually reinforcing cycle (see Chart 3).

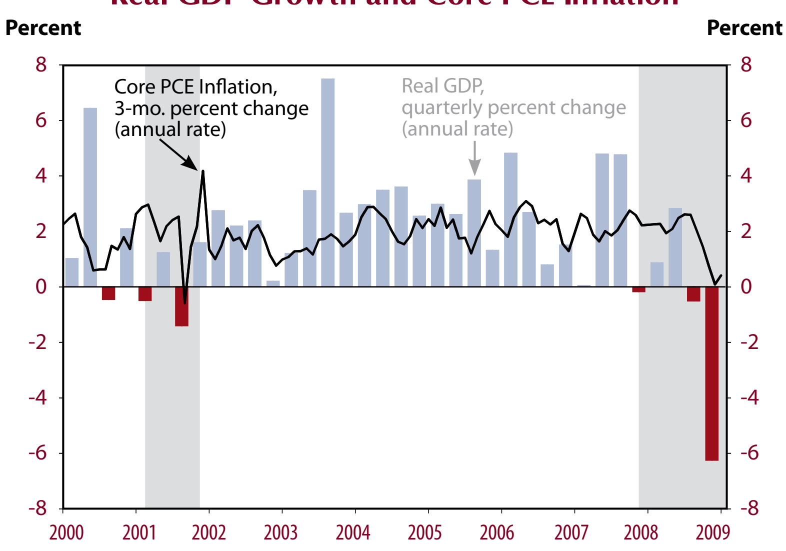
Policy Actions

An important lesson from both economic theory and history is that policymakers must confront circumstances like these with prompt and aggressive action. Even so, in the first half of 2008, the conduct of monetary policy was complicated by rising commodity prices that pushed up the headline inflation rate. The Federal Open Market Committee (FOMC) nonetheless expected inflationary pressures to subside, and longer-term inflation expectations appeared to be stable. With the serious threat to economic growth from the financial crisis, the FOMC cut the federal funds rate target by roughly five percentage points in the period following the onset of the crisis. In December 2008, the FOMC took the historic step of lowering the federal funds rate essentially to its "zero bound," establishing a target range of 0 to 1/4 percent.

Adverse feedback loop: financial crisis and severe recession

Chart 3

Real GDP Growth and Core PCE Inflation



GDP: Gross domestic product
PCE: Personal consumption expenditures

Expanded Policy Toolbox

Due to the extraordinary stress in financial markets, in addition to lowering the federal funds rate target, the Federal Reserve employed a set of new tools to improve the functioning of credit markets, ease financial conditions, and support economic activity more generally. As early as December 2007, the Federal Reserve established the first of a number of new liquidity and credit facilities, the Term Auction Facility (TAF), to address the dislocation in the term interbank market.[2] This facility was set up as an auction and served as another vehicle for extending discount window loans to depository institutions. Amid the global scope of the financial crisis, the Federal Reserve also supported the provision of U.S. dollar liquidity in foreign markets by vastly expanding its network of currency swap lines with other central banks starting in December of 2007.

These facilities for providing liquidity to depositories are in keeping with the Federal Reserve's traditional role as lender of last resort. However, since the financial crisis also hit nonbank financial institutions and key markets, providing liquidity to depository institutions alone was not sufficient to meet the liquidity and credit demands of the economy. In response, the Federal Reserve employed a number of other new tools, some of which involved using the Fed's authority to make direct purchases of U.S. government agency securities. For others, the Federal Reserve invoked Section 13(3) of the Federal Reserve Act to lend in "unusual and exigent circumstances" to "individuals, partnerships, or corporations" that are "unable to secure adequate credit accommodations from other banking institutions." Under this authority, the Federal Reserve initiated a number of special credit facilities to extend credit to a broader range of counterparties, against a broader set of collateral, and for relatively longer terms (see Box 2: Federal Reserve Bank Credit).

The goals of these policy tools are to promote the dissemination of liquidity, foster the liquidity of key securities, increase the flow of credit to seriously impaired sectors, and lower interest rates in targeted nonbank credit

2 *To further ease liquidity pressures at quarter- and year-end, the Federal Reserve announced the forward auctions of TAF loans on July 30, 2008.*

Box 2: Federal Reserve Bank Credit

March 2009

Program/Enhancement	Participants	Description	Limit
Loans to depositories and central banks			
Discount Window* [1]	Depository institutions (DIs)[2]	Collateralized, recourse loans [3]	no stated limit
Term Auction Facility (TAF) (Dec. 12, 2007)[1]	DIs eligible for primary credit	Collateralized, recourse loans, 28-day and 84-day funding [3]	$900 b
Forward TAF (Sept. 29, 2008)	DIs eligible for primary credit	Auction of options on term-lending over year-end [3]	OBS**
Foreign exchange (FX) swaps (Dec. 12, 2007)	Central banks[4]	Temporary reciprocal currency swap lines between the Federal Reserve and other central banks to meet the demand for U.S. dollar-denominated funding by foreign DIs	$755 b
Asset-Backed Commercial Paper Money Market Fund Liquidity Facility (AMLF) (Sept. 19, 2008)	DIs, bank holding companies, U.S. branches and agencies of foreign banks	Collateralized, nonrecourse loans to purchase highly rated asset-backed commercial paper from money market mutual funds (MMMFs); maturity of funding equal to maturity of collateral pledged [5]	Amount held by MMMFs
Other liquidity and credit market facilities			
Repurchase agreements overnight* and term [6]	Primary dealers	Collateralized, overnight and term loans provided via auctions [7]	no stated limit
Primary Dealer Credit Facility (PDCF) (Mar. 16,2008)	Primary dealers	Collateralized, recourse, overnight, loans [8]	no stated limit
Commercial Paper Funding Facility (CPFF) (Oct. 7, 2008)	Highly rated U.S. commercial paper (CP) issuers and U.S. CP issuers with foreign parents	Loans to Federal Reserve Bank of NY created Special Purpose Vehicle (SPV) investing in CP of eligible participants	no stated limit
Money Market Investor Funding Facility (MMIFF) (Oct. 21, 2008)	U.S. 2a-7 MMMFs	Federal Reserve Bank of NY provides senior secured loans to private SPVs that invest in eligible assets issued by designated financial institutions [9]	$540 b [10]
Overnight Securities Lending*	Primary dealers	Treasury general collateral (from the Federal Reserve System Open Market Account) available to primary dealers via auction	no stated limit
Term Securities Lending Facility (TSLF) (Mar. 11, 2008)	Primary dealers	Treasury general collateral (from the System Open Market Account) available via auction for 28-day maturity [11]	$200 b
TSLF Options (TOP) (Sept. 29, 2008)	Primary dealers	Auction of options to borrow Treasury securities from the TSLF	OBS [12]
Term Asset-Backed Securities Loan Facility (TALF) (Program announced on Nov. 25, 2008, and launched on Mar. 3, 2009)	Eligible U.S. borrowers holding qualified asset-backed securities[13] (ABS)	Nonrecourse loans of up to three years, fully secured by eligible ABS The U.S. Treasury provides up to $100 billion of credit protection[14]	$1 tr

Shading indicates programs established using emergency authority under Section 13.3 of the Federal Reserve Act.

* Previously established program or facility. ** Off balance sheet.

1. On August 17, 2007, the Federal Reserve reduced to 50 basis points (b.p.) the spread for the primary credit rate over the federal funds target and allowed 30-days loans. On March 17, 2008, the Federal Reserve reduced to 25 b.p. the spread for the primary credit rate over the federal funds target and allowed up to 90-day loans.
2. Eligible institutions are U.S. depository institutions and branches and agencies of foreign banks operating in the U.S.
3. Eligible collateral includes (but is not limited to) U.S. government and agency securities, foreign sovereign debt obligations, municipal and corporate debt, ABS, CP, bank-issued assets, and customer obligations.
4. Programs created with: European Central Bank and Swiss National Bank (December 12, 2007); Bank of Canada, Bank of England, and Bank of Japan (September 18, 2008); Reserve Bank of Australia, Sveriges Riksbank, De Nederlandsche Bank, and Norges Bank (September 24, 2008); Reserve Bank of New Zealand (October 28, 2008); Banco Central do Brasil, Banco de Mexico, Bank of Korea, and Monetary Authority of Singapore (October 29, 2008).
5. Eligible collateral must be rated A1/P1/F1 by at least two of the rating agencies. The funding rate is equal to the Federal Reserve Bank of Boston's primary credit rate.
6. Term repurchase agreements authorized on March 7, 2008.
7. Eligible collateral includes U.S. Treasury securities, direct agency obligations, and agency MBS that are eligible as collateral in open market operations.
8. Eligible collateral includes securities used for tri-party repurchase agreements arranged by the Federal Reserve Bank of NY, as well as all investment-grade corporate securities, municipal securities, MBS and ABS for which a price is available.
9. Eligible assets: U.S. dollar-denominated certificates of deposit, bank notes, and CP, with remaining maturity of 7 to 90 days. Assets must be issued by one of ten designated financial institutions and be rated A1/P1/F1 by at least two of the rating agencies.
10. Maximum holding of the SPV of any single issuer is limited to the maximum amount of paper outstanding by that issuer between January 1, 2008 and August 31, 2008.
11. TSLF conducts Schedule 1 auctions involving exchanges of all securities used in tri-party repos and schedule 2 auctions involving collateral in the schedule 1 auctions plus investment-grade corporate securities, municipal securities, mortgage-backed securities, and ABS.
12. Limit of $150 billion for each auction.
13. Eligible borrowers include business entities that are organized under the laws of the United States or a political subdivision or territory thereof (including such an entity that has a non-U.S. parent company) or U.S. branches or agencies of foreign banks.
14. Eligible collateral includes highly rated ABS backed by certain consumer and business debt and could be expanded to certain assets backed by residential or commercial mortgages. An SPV will be created by the Federal Reserve Bank of New York to purchase any assets acquired through TALF lending with the first $100 billion of funding for the SPV provided by the U.S. Treasury.

Box 2 (continued): **Federal Reserve Bank Credit**

March 2009

Program/Enhancement	Participants	Description	Limit
Federal Reserve U.S. Treasury and agency securities held directly			
U.S. Treasury Securities*	Primary dealers	Open market purchases from primary dealers	no stated limit
GSE direct obligations (Nov. 25, 2008)[15]	Primary dealers	Federal Reserve Bank of NY makes purchases of direct GSE obligation from primary dealers	$200 b
Federal agency MBS (Nov. 25, 2008)[15]	Selected asset managers	Purchases of agency MBS conducted by asset managers selected via a competitive process	$1.25 t
Federal Reserve Direct Financial Assistance Facilities			
Maiden Lane LLC [16] (July 3, 2008)	Federal Reserve Bank of NY established the LLC to acquire selected assets of Bear Stearns in connection with the acquisition by JP Morgan Chase.	Nonrecourse loan to the LLC	$29 b
AIG credit (Sept. 16, 2008)[17]	Federal Reserve Bank of NY established the LLC to acquire assets of AIG.	Loans guaranteed by AIG assets	[17]
Maiden Lane II LLC (Nov. 10, 2008)	Federal Reserve Bank of NY established the LLC to acquire residential MBS from AIG's U.S. securities lending collateral portfolio.	Nonrecourse loan to the LLC	$22.5 b
Maiden Lane III LLC (Nov. 10, 2008)	Federal Reserve Bank of NY established the LLC to acquire multisector collateralized debt obligations on which AIG has written credit default swap contracts.	Nonrecourse loan to the LLC	$30 b
Citigroup (Nov. 23, 2008)	Citigroup	Treasury and FDIC provide protection against a pool of Citigroup's asset; Federal Reserve to provide a nonrecourse loan to "backstop" residual risk in Citigroup's asset pool	OBS** [18]
Bank of America Corp. (BAC) (Jan. 16, 2009)	Bank of America Corp.	Treasury and FDIC provide protection against a pool of BAC assets; Federal Reserve to provide a nonrecourse loan to "backstop" residual risk in BAC's asset pool	OBS** [19]

Shading indicates programs established using emergency authority under Section 13.3 of the Federal Reserve Act.

* Previously established program or facility. ** Off balance sheet.

15. Purchases of direct obligations of, and obligations fully guaranteed as to principal-interest by, any U.S. government agencies, under the direction of the FOMC, are permitted under section 14(b) of the Federal Reserve Act. Explicit programs to purchase direct obligations of GSEs Fannie Mae, Freddie Mac, and Federal Home Loan Banks and MBS backed by housing agencies (Fannie Mae, Freddie Mac, and Ginnie Mae) were announced on November 25, 2008.
16. Limited Liability Corporation.
17. Terms were modified on November 10, 2008, and on March 2, 2009. Based on latter modification, the revolving credit facility is to be reduced from $60 billion to no less than $25 billion. In return for the reduction in the revolving credit facility, the Federal Reserve Bank of NY will get preferred interest in two SPVs created to hold common shares of two life insurance subsidiaries of AIG. The Federal Reserve Bank of New York is authorized to make up to $8.5 billion in new loans to SPVs established by domestic life insurance subsidiaries of AIG.
18. Asset pool is valued at $306 billion.
19. Asset pool is valued at $118 billion.

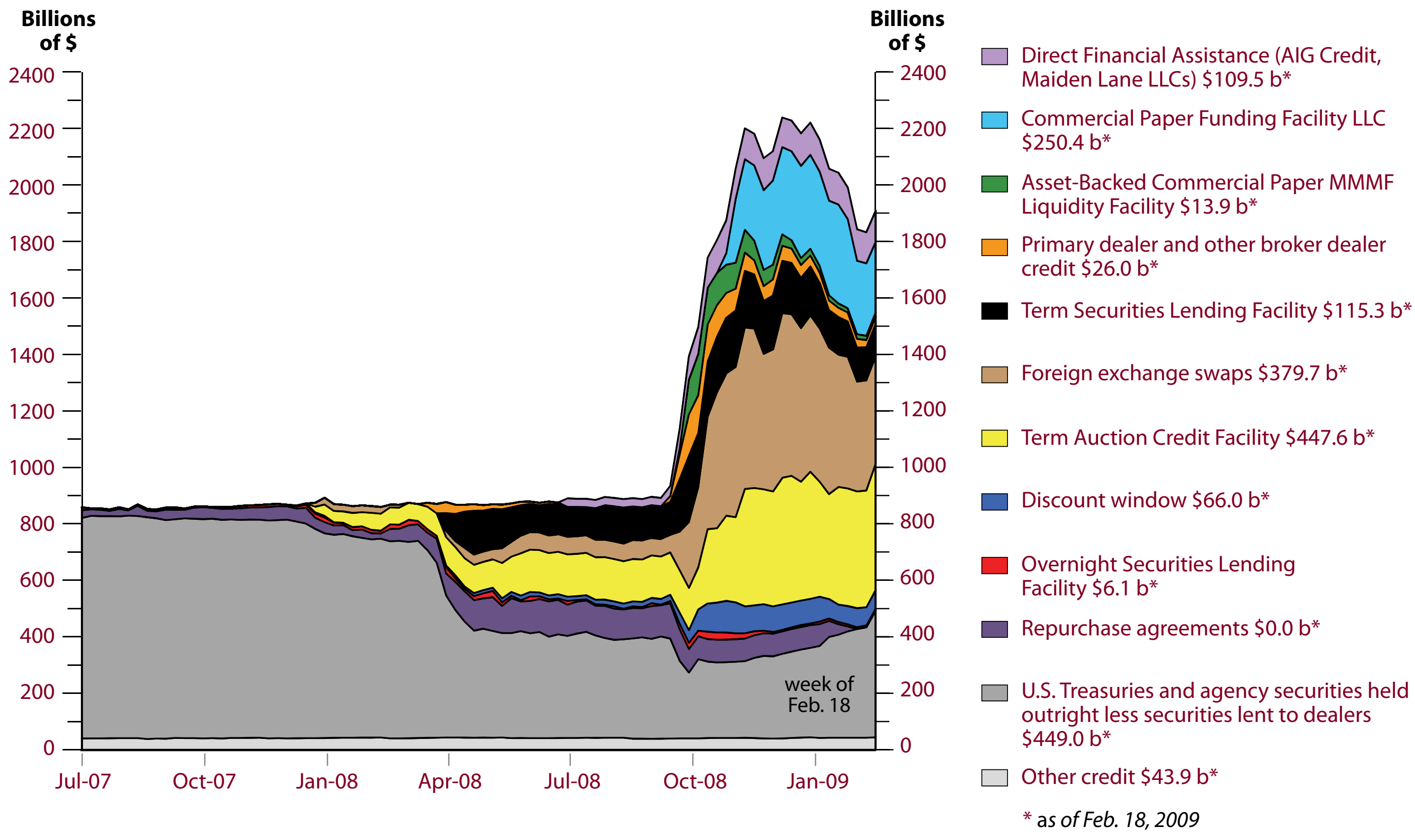
markets. For primary dealers, these tools provide access to collateralized loans from the Federal Reserve and the option to borrow Treasury securities.[3] For others, these measures provide liquidity for money market securities held by money market mutual funds, support the extension of credit to highly rated issuers of commercial paper, and enable the Federal Reserve to purchase both the direct obligations of Fannie Mae, Freddie Mac, and the Federal Home Loan Banks and agency MBS to help lower mortgage interest rates. The Term Asset-Backed Securities Loan Facility (TALF), which was launched in early 2009, is directed at supporting the particularly hard-hit asset-backed securities market, which is instrumental to the flow of credit for consumer loans, student loans, business loans, and certain mortgages that are not eligible for inclusion in securities guaranteed by the housing GSEs.

Finally, a number of tools made possible under the Federal Reserve's emergency powers involve targeted financial assistance to preserve the stability of systemically critical financial institutions. For example, these include the credit facilities established by the Federal Reserve Bank of New York in connection with the acquisition of Bear Stearns by JPMorgan Chase and the efforts to stabilize insurance giant American International Group (AIG).

Fed turns to unconventional policy tools

Chart 4

Federal Reserve Bank Credit



3 *The Federal Reserve Bank of New York trades U.S. government securities and other selected securities with designated primary dealers, which include banks and securities broker-dealers.*

The Fed's Growing Balance Sheet

The implementation of these policy tools has substantially changed the composition and, since mid-September 2008, the size of the Federal Reserve System's balance sheet (see Chart 4).[4] The Federal Reserve's balance sheet expanded rapidly toward the latter part of 2008 with the deterioration in financial market conditions that led to the failure of Lehman Brothers, followed by the near collapse of AIG, the "run" on prime money market funds, the severe dislocations in commercial paper markets, and the general flight to quality by investors seeking the safety of Treasury securities.[5] At the beginning of 2009, Federal Reserve Bank credit reached about $2.3 trillion, compared with about $900 billion prior to the start of the financial turmoil.

It is difficult to assess the effects of individual facilities on particular markets, let alone the impact on overall financial conditions. Along with the Federal Reserve initiatives, the federal government undertook a number of efforts to support financial markets, including the Treasury Department's Troubled Asset Relief Program, the Federal Deposit Insurance Corporation's Temporary Liquidity Guarantee Program, and the placement of Fannie Mae and Freddie Mac in conservatorship. These programs were designed to work with the Federal Reserve initiatives to mitigate the effects of the dislocation in financial markets. Indeed, there are signs that stress in financial markets eased from the crescendo reached in mid-September 2008. The improvement was evident in lower risk spreads in commercial paper markets (see Chart 5) and in a narrowing of the spreads on the term Libor relative to the OIS rates (see Chart 1), though the latter remained somewhat elevated. In other markets targeted by the Federal Reserve initiatives, risk premiums on GSE-backed MBS moved lower in late 2008 and early 2009, helping to bring down interest rates on conforming mortgages.

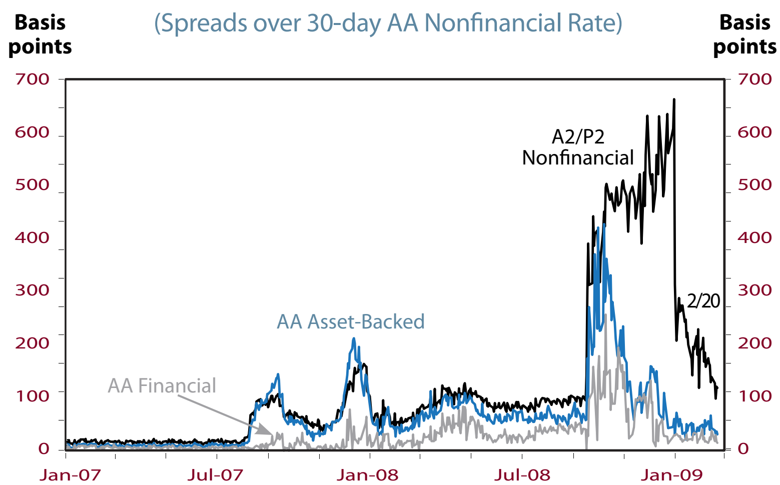
Looking forward, the use of the Federal Reserve's balance sheet to restore financial stability and economic growth has become even more important, with the federal funds rate close to zero at the beginning of 2009. In addition, the Federal Reserve's communications to the public about its policy formulation will be vital in the period ahead. ■

Signs of improvement in commercial paper market

Chart 5

Commercial Paper Risk Spreads

(Spreads over 30-day AA Nonfinancial Rate)



---

4 *The Treasury's Special Funding Program and the authorization of the Federal Reserve to pay interest on reserves allowed the Federal Reserve to expand its balance sheet while separately pursuing monetary policy actions directed at affecting the level of the federal funds rate.*

5 *The federal government also took extraordinary actions at the time by guaranteeing the shares of money market mutual funds, at the same time as the Federal Deposit Insurance Corporation guaranteed senior unsecured debt of depository institutions and their holding companies and provided full deposit insurance coverage for non-interest-bearing transaction accounts.*