

CRS Report for Congress

Containing Financial Crisis

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Containing Financial Crisis

Summary

There is no precise definition of “financial crisis,” but a common view is that disruptions in financial markets rise to the level of a crisis when the flow of credit to households and businesses is constrained and the real economy of goods and services is adversely affected. Since mid-2007, governments have tried with limited success to keep the downturn in U.S. subprime housing from developing into such a crisis.

Subprime mortgage problems, and the financial shock they caused, were widely anticipated, but the spread of turmoil into many seemingly unrelated parts of the global financial system was not. Many of the losses occurring in diverse firms and markets — often quite severe — have common features: the use of complex, hard-to-value financial instruments; large speculative positions underwritten by borrowed funds, or leverage; and the use of off-the-books entities to remove risky trading activities from the balance sheets of major financial institutions. Because of the prevalence of innovative financial arrangements, the housing downturn appears to have triggered market dynamics that amplify the effects of financial shocks and generate self-reinforcing, downward financial and economic spirals.

The Federal Reserve and foreign central banks have cut short-term interest rates dramatically and injected trillions of dollars into the banking system to keep credit flowing. The Fed and Treasury have engaged in a series of extraordinary interventions to shore up failing financial institutions. The Fed provided \$29 billion to underwrite the rescue-through-acquisition of Bear Stearns, a leading investment bank, and loaned billions to AIG, a leading insurer. Fannie Mae and Freddie Mac have been placed in government conservatorship, with the Treasury pledging to stand behind the \$5 trillion in bonds the two firms sold or guaranteed. In September 2008, as market conditions appeared to worsen, Congress passed a \$700 billion rescue plan (P.L. 110-343), authorizing the Treasury to purchase securities to shore up bank balance sheets. In October, as conditions appeared to worsen, the Fed entered the commercial paper market and purchased tens of billions in short-term corporate debt. Simultaneously, trillions of dollars in private debt now carries government guarantees. The duration of the current instability is in marked contrast to financial shocks of recent decades, when the central bank was able to contain market problems quickly with little or no interruption of U.S. economic growth.

Depending on how soon normal market conditions are restored, and on the severity of the economic slowdown, Congress may view the social costs of failed financial speculation as sufficient to warrant new restrictions to reduce the incidence of losses that have system-wide impacts or to put the markets and the economy in a better position to weather such shocks. The Treasury has already proposed a sweeping restructuring of financial regulation.

This report supplements CRS Report RL34182, *Financial Crisis? The Liquidity Crunch of August 2007*, by Darryl Getter et al., which describes in greater detail the channels through which subprime problems cascaded through the financial system. This report focuses on the efforts of regulators to restore market stability and will be updated as developments warrant.

Contents

Introduction	1
The Underlying Financial Problems	4
Complex Finance: The House of Cards	6
SIVs	6
Metro's Credit Enhancement	8
What Makes a Financial Crisis?	9
Government Interventions	13
Open Market Operations and Monetary Policy	13
The Discount Window	13
Term Auction Facility (TAF)	14
Treasury's "Super-SIV" Proposal	15
Provision of New Capital to Financial Institutions	16
Bear Stearns	17
Fannie Mae and Freddie Mac	17
AIG	18
The \$700 Billion Troubled Assets Relief Program (P.L. 110-343) ...	19
Increases in Government Guarantees and Insurance	20
Commercial Paper	21
Citigroup	21
Policy Issues: Are Regulators' Tools Adequate?	21
Information	21
Speculation	23

List of Figures

Figure 1. Bank Stock Indices and the S&P 500, Jan. 2007 - Oct. 2008	2
Figure 2. Developed Country Bank Stock Indices, Jan. 2007 - Oct. 2008	2
Figure 3. Bank and Financial Stock Indices, Selected Countries, Jan. 2007 - Oct. 2008	3
Figure 4. Structured Investment Vehicle Cash Flows	7
Figure 5. The Leverage Cycle	11

List of Tables

Table 1. Debt Growth by Sector, 2007-2008	10
-------------------------------------------------	----

Containing Financial Crisis

Introduction

In mid-2007, mounting losses in subprime mortgage markets triggered disturbances throughout the international financial system. The scale of the turmoil has been surprising, given the small size of the U.S. subprime market in relation to global financial markets.¹ Not only is subprime a comparatively small market, its problems were known well in advance: when the rapid rise in housing prices stopped in 2006, it was inevitable that many subprime borrowers would have difficulty making payments, particularly those whose adjustable mortgage rates were scheduled to reset in 2007 and 2008. A Swiss bank CEO called subprime loan losses “probably the longest anticipated crisis we have ever seen.”²

Nevertheless, a wide range of financial institutions have been affected adversely, many of which had little direct exposure to the subprime mortgage market. Almost weekly since July 2007, the financial press has highlighted a new trouble spot, including commercial and investment banks, issuers of commercial paper, conduits for securitization of loans, credit swaps, jumbo mortgages, money market funds, consumer lenders, hedge funds, bond insurers, government-sponsored enterprises, state and local investment funds, state and municipal governments themselves, small business lending, and so on. As economic conditions deteriorate, many fear that there may be more problems ahead, possibly involving such major financial markets as commercial real estate and credit card lending. In 2008, these periodic crises grew more severe, with several leading U.S. financial institutions requiring government assistance, merging with other firms, or failing. By September, not a single “bulge bracket” investment bank remained standing: they had either failed (Lehman Brothers), merged (Merrill Lynch and Bear Stearns), or converted themselves into commercial bank holding companies (Goldman Sachs and Morgan Stanley). The links between many of these crises and subprime mortgages are not obvious, but they are correctly viewed as symptoms of a common underlying problem.

The stock market has certainly perceived systemic weakness across financial sectors. As **Figure 1** below indicates, share prices for commercial banks have significantly underperformed the market as a whole, as represented by the Standard & Poor’s 500 index. Between January 2007 and October 2008, shares in those sectors lost over half their value. S&P 500 bank shares (including the largest U.S.

¹ About \$1.2 trillion in subprime mortgages are outstanding, and most of them are being paid off. This compares to about \$11 trillion in total U.S. mortgage debt, and \$51 trillion in credit market debt outstanding.

² Brian Caplen, “Credit Suisse CEO: Clear View Curtails Crisis Fallout,” *The Banker*, January 1, 2008.

banks) have done worse than banks listed on Nasdaq, probably because they are more exposed to the complex instruments, structures, and trading practices at the heart of the crisis.

Figure 1. Bank Stock Indices and the S&P 500, Jan. 2007 - Oct. 2008



Source: Global Financial Data.

Figure 2. Developed Country Bank Stock Indices, Jan. 2007 - Oct. 2008

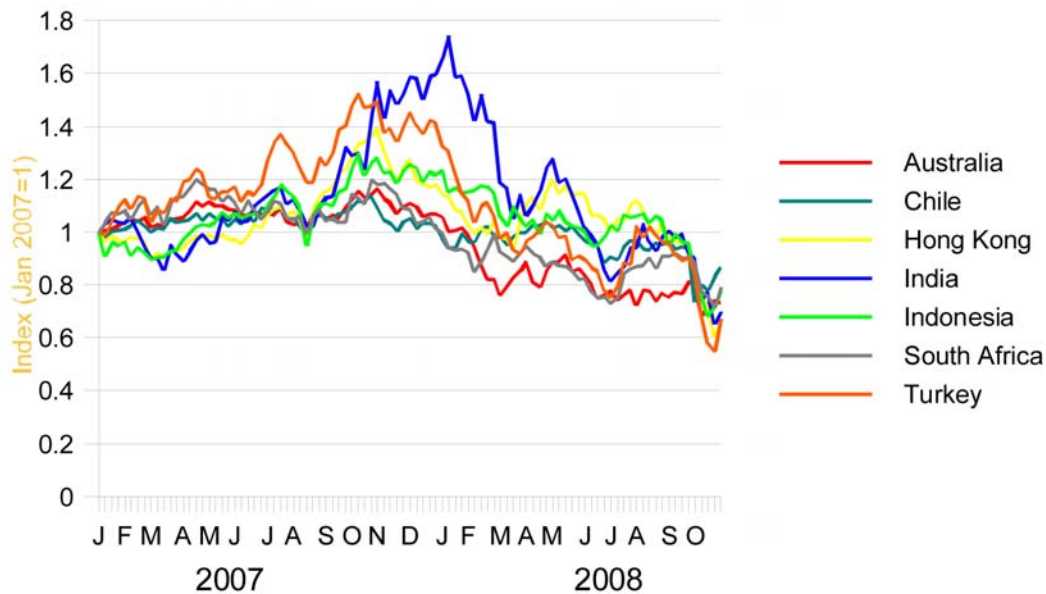


Source: Global Financial Data.

Figure 2 shows that bank stocks in Japan, Germany, France, and the UK have followed the same downward trend as the U.S. indices. This should not be surprising; large banks in all these countries have significant U.S. operations, just as the major U.S. banks are active in Europe and Asia. By the end of October 2008, all these indices (except Nasdaq banks) had lost more than half their value since the beginning of 2007.

Figure 3 shows indices of bank or financial stocks from seven different countries with smaller financial markets. Again, there is a common trend, but it is a different pattern. These markets appeared to shrug off problems in the major financial centers in 2007. All seven indices showed gains over that year. Late in 2007 (or early in 2008), however, there began a steep decline, and they all dropped sharply during the panic in September 2008 (the period that led to the enactment of the \$700 billion emergency package in the United States).

Figure 3. Bank and Financial Stock Indices, Selected Countries, Jan. 2007 - Oct. 2008



Source: Global Financial Data.

The mechanism that transmitted problems from the major financial centers of the developed countries to these far-flung financial systems has not been fully explained. A global economic slowdown may be a partial explanation, but the decline in stock prices began well before macroeconomic indicators turned negative. All we can say for certain is that by the beginning of 2008, stock investors around the world had decided that banking and financial intermediation had become more risky and that expectations of profits had diminished significantly.³

³ For discussion of the global nature of the crisis, see CRS Report RL34742, *The U.S. Financial Crisis: The Global Dimension with Implications for U.S. Policy*, by Dick K. Nanto et al.

The Underlying Financial Problems

CRS Report RL34182, *Financial Crisis? The Liquidity Crunch of August 2007*, by Darryl Getter et al., describes the channels through which distress in subprime mortgages spread through the broader U.S. financial system. In addition to causing direct asset losses, the subprime crisis triggered a reassessment of financial risk that encompassed other debt markets, including leveraged loans,⁴ takeover financing, credit derivatives, and commercial paper. There was — and still remains — great uncertainty regarding the true value of certain financial instruments, especially those with complex structures or for which active trading markets do not exist.

To understand how a relatively small market sector — U.S. subprime mortgages — could trigger such widespread chaos in global markets, it helps to consider ways that financial markets have evolved over decades. Innovations in financial theory, improvements in communications and computing technology, removal of barriers to international investment flows, the increasing reliance on trading markets by both businesses seeking funds and households investing their savings, and the growth of financial services relative to the rest of the economy are all factors that have transformed the financial system since World War II. The present crisis is the gravest challenge that this new system of markets has faced, and it may lead to fundamental changes in the way the business of financial intermediation is regulated.

In the 1930s, the last time this level of turmoil occurred, widespread bank failures were followed by a long economic downturn. In response, Congress recognized that banks were special: their assets tended to be long-term loans and their liabilities were primarily short-term deposits. This meant that even sound and solvent banks could be destroyed if depositors sought to withdraw their money at the same time. Their assets were illiquid. Worse, liquidity problems were contagious: if one bank failed, depositors were likely to run on healthy banks.

To stabilize the banking system, Congress instituted deposit insurance and gave bank regulators strong powers to limit the amount of risk that banks could take. Risky activities, like underwriting and sale of corporate securities, were placed off limits. Over the years, however, bank services and bank risks migrated outside of the regulatory safety net. Wall Street securities firms, for example, developed the commercial paper market, which replaced much of banks' short-term corporate lending. Investment banks like Merrill Lynch were never subject to the same kind of safety and soundness regulation as commercial banks. Newer market participants, like hedge funds, were not subject to any regulation at all. Even regulated banks were gradually allowed to own securities and insurance businesses within a holding company structure, and they were allowed to hold highly-risky speculative positions in off-balance sheet "special purpose entities."

In other words, bank-like investment strategies — such as the use of leverage (or borrowed money) and financing long-term investments with short-term debt — became common outside the safety net provided by deposit insurance and strong

⁴ Risky bank loans equivalent to high-yield "junk" bonds, often made in support of corporate takeovers or buyouts.

regulation. As a result, nonbank institutions became vulnerable to runs — if markets lost confidence in them, their sources of funds could dry up. And these nonbank runs could also be contagious, although this was not widely recognized before the current crisis.

Another notable development of the past two or three decades is the development of complex and hard-to-value financial instruments. For example, simple debt contracts like home mortgages were sold by the original lenders and packaged into bonds with a wide range of risk and reward characteristics. These bonds were often pooled again and sliced and diced into even more complex packages. Synthetic securities were created based on derivative instruments that replicate the price changes of an asset without requiring actual ownership of the asset itself. The relationship between the performance of an underlying financial asset and the complex security or derivative based on it was never simple, and under crisis conditions has proved to be completely unpredictable.

Complexity reduces transparency. Neither regulators nor market participants can easily assess the true financial condition of firms that hold or trade these newer instruments. Since large parts of derivatives markets are unregulated, there is a global web of financial claims and counterclaims that is essentially invisible to financial supervisors and market participants alike.

The new finance was based on the ability to quantify and disaggregate risks in ways that were not possible before. As derivatives markets grew, a common view was that they made the financial system more efficient and more resilient to shocks: they let risks be transferred to those who were best able to understand them and who were willing to take on risk in search of profits. Just as farmers can use grain futures to protect themselves from unexpected declines in prices, financial derivatives promised to allow many financial market participants to better manage risks arising from all sorts of financial transactions, holdings, and obligations.

The benefits, in theory, are not confined to market participants. If farm failures can be prevented by shifting market losses from producers onto speculators on the Chicago Board of Trade, the entire economy gains a valuable shock absorber. Similarly, if hedge funds and other financial speculators take on credit risk, interest rate risk, currency risk, and so on, the core institutions of the financial system ought to be able to operate in a more stable and predictable environment, with general economic benefits in terms of lower costs to borrowers and higher returns to savers.

The crisis suggests that the system has not worked as hoped. Rather than use derivatives and other innovative financial instruments to shed risk, the core institutions have employed them in speculative investment strategies, increasing their risk. The risks of these strategies appeared tolerable, but now it appears that the underlying risk assumptions or models were deficient because they were based on historical price data that prevailed during the relatively benign financial conditions of the past 40 years.⁵

⁵ Contracts linked to subprime mortgages had only a few years of data on which to model
(continued...)

The shock of losses from rising mortgage delinquencies and foreclosures, though serious, was probably not in itself sufficient to cause the crisis. It was also necessary that the financial system be structured in such a way as to multiply the initial shock and trigger dynamics that caused widening losses among financial institutions and now appear to weigh down the prospects for real economic growth. Key characteristics that produced this systemic vulnerability include

- the use of complex financial instruments, whose value is often linked by complex formulae to the value of other instruments or financial variables, and for which no active trading markets exist;
- extensive use of leverage, or borrowed funds, which permits institutions to take larger market positions with a given capital base, increasing potential profits (but also losses); and
- the practice of moving risky financial speculation off the books, into nominally independent accounting entities, so that the results do not appear in the financial accounts of the parent financial institution.

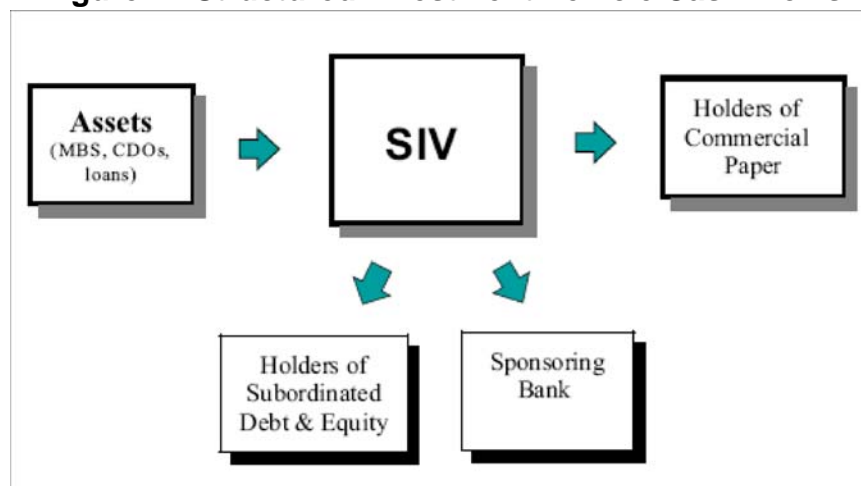
Complex Finance: The House of Cards

A result of financial innovation was the implementation of many financial strategies that were considered low risk and very likely to produce steady gains for participants. In the crisis, however, risks that were discounted have come to the fore, often producing large losses for which institutions and regulators have been unprepared. Two examples of these sorts of arrangements are set out briefly below.

SIVs. One example is the Structured Investment Vehicle, or SIV, an entity created by banks to enable speculation on the relationship between short- and long-term interest rates. In mid-2007, commercial banks operated several dozen SIVs, with total assets of between \$350 billion and \$400 billion. The market leader was Citigroup. **Figure 4** illustrates the basic cash flows. The SIV bought long-term debt assets, often mortgage-backed bonds, from which it received interest income. Purchase of these assets was financed by issuing short-term debt, usually commercial paper.⁶ The SIV's net revenue was determined by the difference, or spread, between these two cash flows; the operation was profitable so long as the payouts from the assets exceeded interest payments to the commercial paper holders.

⁵ (...continued)
performance.

⁶ Commercial paper is used as a source of short-term borrowing by many firms, financial and nonfinancial. The maturity is generally between three months and one year.

Figure 4. Structured Investment Vehicle Cash Flows

Source: CRS.

The profits were distributed in two ways: first as fees for services to the sponsoring institution, and second, as dividends or interest to holders of subordinated debt and equity, who were the nominal owners of the SIV. (Accounting rules require outside ownership for the SIV to be carried off the books of the sponsoring bank. In general, however, the bank was responsible for investment decisions and provided all brokerage, trade processing, and other services.)

Although data are not routinely reported or published, one estimate is that 72% of the equity in mortgage conduits, of which SIVs are a subset, was held by hedge funds.⁷ Hedge funds are typically highly leveraged, which suggests that much of the equity capital in SIVs was borrowed, perhaps from the sponsoring banks themselves.

Many of the assets held by SIVs were mortgage-related, but rarely were they actual loans. Rather, they were securities backed by pools of loans, in which the interest and principal payments of homeowners are passed through to the holders of the bonds. Financial engineers also bundled mortgage-backed bonds into pools of securities called collateralized debt obligations (CDOs), and sold claims against them. CDOs were carved into various classes with different risk characteristics and yields. The portions of the pool that proved most difficult to sell might be pooled again, carved up, and resold — in a so-called CDO squared.

Despite their complexity, such securities were often able to obtain AAA ratings, and they were offered interest rates significantly higher than AAA corporate bonds. Thus, CDOs found a ready market in institutional investors seeking higher yields than traditional debt instruments offered in the early 2000s, and they were incorporated into aggressive speculative strategies such as SIVs.

⁷ Adrian Blundell-Wignall, *Structured Products: Implications for Financial Markets*, [OECD] *Financial Market Trends*, No. 93, 2007, p. 45.

As subprime defaults climbed to historically unprecedented levels in 2007, the value of mortgage-backed instruments became hard to determine, since it depended crucially on uncertain projections of future loan performance. CDOs were particularly affected, since by the time loans had been pooled and resold two or three times, it was difficult for investors to ascertain exactly what they owned. The assumptions about credit risk that underpinned the CDO market, which had provided the justification for those initial AAA ratings, were shown to be wildly inaccurate.

SIVs found that they were no longer able to sell the commercial paper that supported their assets. Sponsoring banks often extended credit to the SIVs (and in many cases were compelled to do so, having granted contingent lines of credit in order to secure high ratings for their SIVs' commercial paper) or took the assets onto their own balance sheets, exacerbating their own financial difficulties. Major banks did not allow SIVs to fail because of the reputational damage that would follow, but the associated losses were considerable.

SIVs are only one part of the story of liquidity problems in 2007 and 2008, but they are instructive because they include three features that contributed disturbance elsewhere. First, they involved the use of innovative securities, which were hard to value in the best of circumstances and which had little history to indicate how they might behave in a severe market downturn. Second, risks were underestimated: the SIVs were a form of highly-leveraged speculation, which was dependent on the assumption that the markets would always supply liquidity. Finally, they were off balance sheet entities: few in the markets (or perhaps in the regulatory agencies) had an accurate idea of the scope or nature of their activities until the trouble came.⁸ The result of the interaction of these factors with a sharp housing market downturn is the most sustained period of instability in U.S. financial markets since the Great Depression.

Metro's Credit Enhancement. The second example is a transaction that appeared virtually risk-free at the time it was structured. Metro, the Washington, DC, area transit system, took out a long-term loan from a Belgian bank, KBC Group, to finance capital spending.⁹ Metro purchased a contract from AIG, the New York insurance firm, which guaranteed timely payment on the loan. Because the loan was insured, Metro received a lower interest rate. AIG received fees. The bank was able to save on capital charges; because the loan was guaranteed by AIG, it was counted as less risky, and the bank could reduce the amount of assets it had to hold against default risk.¹⁰

⁸ For example, Citigroup's SIVs held about \$100 billion in assets at the peak, yet the firm's quarterly report to the Securities and Exchange Commission for the second quarter of 2007 contained no reference to them. (The third quarter report, of course, devoted considerable space to the associated problems and potential losses.)

⁹ The account of this transaction is taken from three *Washington Post* articles by Lena H. Sun: "Judge Tells Metro and Bank to Deal," Nov. 13, 2008, p. B1; "Metro, Bank Make a Deal," Nov. 15, 2008, p. B1; and "U.S. Transit Agencies Ask Congress for Help in Averting Service Cuts," Nov. 19, 2008, p. D2.

¹⁰ The deal also produced tax savings for the participants.

Each of the three parties gained a little, and none expected the deal to fall apart. However, when AIG was downgraded in September 2008, the value of the insurance it provided dropped and the loan was technically in default (even though Metro itself had not missed a payment). Under the terms of the contract, the bank was able to demand immediate repayment of \$43 million, placing a great burden on Metro, which sought and obtained legal relief.

What was the economic substance of the deal? The loan was low-risk to begin with, since Metro is backed by several government units, each of whose cost of capital might rise sharply if Metro were allowed to default on its debt. The purpose of the credit derivative contract was not really to reduce risk, but to permit a kind of arbitrage against capital requirements (and perhaps tax obligations). All parties expected modest gains; the chance of anything going wrong appeared remote.

With hindsight, the transaction did not reduce risk at all. In fact, it added slightly to systemic risk, or the likelihood of the entire financial system becoming unstable under certain improbable circumstances.

The Metro transaction is not isolated. Transit officials told Congress that 31 of the largest U.S. bus and rail systems face similar demands. Metro itself is said to have 14 additional deals with other lenders, involving a total of \$300 million in loans.¹¹ Though small in terms of global financial losses, these deals are emblematic in that they promised a high probability of a small gain and a low probability of a significant loss. Throughout the world, such large losses are coming due.

What Makes a Financial Crisis?

Since August 2007, the Federal Reserve has recognized deteriorating financial markets as a principal threat to the economic outlook. The Fed has eased monetary policy, reducing its target for the federal funds rate from 5.25% (the level that was established in June 2006) to 1.00%. It has declared its willingness to provide liquidity to the financial system.¹² In the process of reaching the lower interest rate target, the Fed, in its open market operations, buys securities from depository institutions, giving them new cash to lend. Lower rates themselves, of course, stimulate demand for credit, as more investment projects become potentially profitable once they can be funded at lower cost.

In recent years, such actions appeared to be sufficient to prevent financial shocks from developing into crises. Neither the stock market crash of 1987 (when the stock market lost 23% of its value in one day), the near collapse of the Long-Term Capital Management hedge fund in 1998 (which threatened to paralyze global bond markets), the “dot.com” crash in 2000-2001 (which again erased trillions of dollars in stock value), nor the September 2001 terrorist attacks (which closed markets and disrupted

¹¹ Ibid.

¹² Liquidity, in central banking terms, means maintaining the flow of credit. The Fed’s declarations signal market participants not to allow credit decisions to be governed by fears that the opposite party may have temporary cash flow problems.

payment systems) was followed by the kind of prolonged financial stress observed in late 2007 and 2008.

It is noteworthy that through mid-2008, there was no contraction in debt outstanding to borrowers in either the household or business sectors. The rate of growth slowed, but the expansion of credit continued.¹³ Emergency government actions, then, were not predicated on restoring creditflows to the real economy, but on ensuring that such flows are not disrupted in the future.¹⁴

Table 1. Debt Growth by Sector, 2007-2008
(percentage change, at annual rates)

Date	Households			Businesses		
	Total	Mortgage	Consumer Credit	Non-corporate Business	Non-financial Corporations	Financial Sectors
2007 Q1	7.0	7.8	5.0	10.4	11.0	10.4
2007 Q2	7.2	7.6	5.5	12.8	13.7	9.9
2007 Q3	6.2	4.9	7.5	14.2	13.6	16.8
2007 Q4	6.1	6.1	4.0	12.1	11.7	10.1
2008 Q1	3.3	2.6	5.2	7.4	6.2	5.4
2008 Q2	1.4	0.8	4.4	5.7	5.6	6.6

Source: Federal Reserve, Flow of Funds Accounts, Table D.1.

Treasury Secretary Paulson stated in January 2008 that large losses reported by several major institutions were a sign that the system is working: “As markets reassess, we should not be surprised or disappointed to see financial institutions writing down assets and strengthening balance sheets. This is market discipline in action and should enhance market confidence over time.”¹⁵

¹³ As data become available for the third quarter of 2008, this picture may change. The amount of consumer credit outstanding, for example, fell in August (but resumed slow growth in September). This shift, however, was mainly due to a dropoff in car loans, which was driven by reduced buyer demand as well as tightening lending standards.

¹⁴ V.V. Chari, Lawrence Christiano, and Patrick J. Kehoe, *Facts and Myths about the Financial Crisis of 2008*, Federal Reserve Bank of Minneapolis Research Department Working Paper 666, Oct. 2008; and Ethan Cohen-Cole, Burcu Duygan-Bump, Jose Fillat, and Judit Montoriol-Garriga, *Looking Behind the Aggregates: A Reply to “Facts and Myths about the Financial Crisis of 2008,”* Federal Reserve Bank of Boston Working Paper No. QAU08-5, Nov. 2008.

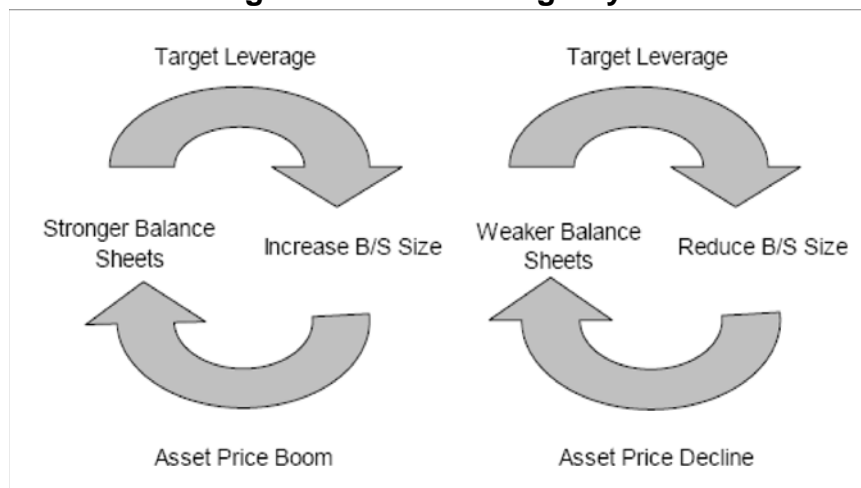
¹⁵ Martin Crutsinger, “Paulson: No Simple Solution to Housing Crisis,” *York Dispatch*, January 7, 2008.

While the self-correcting properties of markets are generally acknowledged, several analysts identify forces that work in the other direction. In their models, shocks produce other shocks, multiplying the effects of an original loss.

In a recent paper, Greenlaw et al. focus on the pro-cyclical nature of leverage.¹⁶ They assume that firms prefer to maintain a more or less constant level of leverage, or ratio of total assets to capital. As the assets that make up a firm's capital base gain in value, the firm can support more assets on the balance sheet. Balance sheet expansion, in turn, involves asset purchases, boosting asset prices further.

When prices are falling, however, the cycle works in reverse. As its capital loses value, the firm must shrink its balance sheet to maintain a given leverage ratio. As firms sell assets to reduce balance sheet exposure, asset prices are driven down. Because financial firms are typically highly leveraged, a balance sheet adjustment of any given size is multiplied. The authors assume that commercial banks have leverage ratios of about 10:1, meaning that a \$1 billion capital loss requires a \$10 billion reduction in their portfolio of assets, which consists primarily of loans. In other words, price shocks to a firm cause behavior that reinforces the movement of prices. These self-reinforcing cycles are illustrated in **Figure 5**.

Figure 5. The Leverage Cycle



Source: David Greenlaw, Jan Hatzius, Anil Kashyap, and Hyun Song Shin, “Leveraged Losses: Lessons from the Mortgage Meltdown,” U.S. Monetary Forum Conference Draft, Feb. 29, 2008, p. 30.

In a 1996 paper, Bernanke, Gertler, and Gilchrist also seek a solution to the “longstanding puzzle” that large fluctuations in aggregate economic activity sometimes arise from what appear to be relatively small impulses.¹⁷ They describe a mechanism they call the “financial accelerator.” They argue that the cost of external finance to a firm — its cost of borrowing — is inversely related to its net

¹⁶ David Greenlaw, Jan Hatzius, Anil Kashyap, and Hyun Song Shin, “Leveraged Losses: Lessons from the Mortgage Meltdown,” U.S. Monetary Forum Conference Draft, February 29, 2008, 47 p.

¹⁷ Ben Bernanke, Mark Gertler, and Simon Gilchrist, “The Financial Accelerator and the Flight to Quality,” *Review of Economics and Statistics*, vol. 78, February 1996, p. 1.

worth. A fall in asset prices reduces the collateral value of the firm's assets, which hinders or raises the cost of borrowing. By simultaneously increasing the need for external finance and restricting its availability, a negative shock causes the firm to reduce spending and production. "To the extent that negative shocks to the economy reduce the net worth of borrowers..., the spending and production effects of the initial shock will be amplified."¹⁸

These two models describe similar effects, acting upon both the supply of and demand for credit. The models suggest that shocks to financial firms can have disproportionate impacts on real economic activity. When financial turbulence interacts with expectations of a contraction in real economic activity, the prospect of another negative spiral emerges. Martin Feldstein, chairman of the Council of Economic Advisers under President Reagan, describes the situation as a kind of Catch-22: "The credit flows needed for economic expansion require confidence in the values of financial assets, but market participants may not have such confidence while the risk of recession hangs over us."¹⁹

Federal Reserve Governor Frederic Mishkin elaborated on this theme in November 2007:

The second type of risk that I consider central to the understanding of financial stability is what I call *macroeconomic risk* — that is, an increase in the probability that a financial disruption will cause significant deterioration in the real economy. Because economic downturns typically result in even greater uncertainty about asset values, such episodes may involve an adverse feedback loop whereby financial disruptions cause investment and consumer spending to decline, which, in turn, causes economic activity to contract. Such contraction then increases uncertainty about the value of assets, and, as a result, the financial disruption worsens. In turn, this development causes economic activity to contract further in a perverse cycle.²⁰

This scenario, according to Mishkin, explains why the Federal Reserve is unwilling to assume that markets will self-correct without serious damage to the real economy. Financial instability, "if allowed to develop fully," could have severely negative consequences in both financial markets and the global economy.²¹ To address the risk — however small — that the current situation could develop into a full-blown financial crisis, cutting off credit flows that support investment and spending, the Fed (and other central banks and regulators) have taken extraordinary steps. In one description that is perhaps not entirely hyperbolic, central bankers have

¹⁸ Ibid., p. 2.

¹⁹ Martin Feldstein, "Our Economic Dilemma," *Wall Street Journal*, February 20, 2008, p. A15.

²⁰ Frederic S. Mishkin, "Financial Instability and Monetary Policy," Speech at the Risk USA 2007 Conference, New York, November 5, 2007.

²¹ Ibid.

decided to “tear up their rule books and established practices...to inject cash, resuscitate the interbank market, and hopefully ease the credit squeeze.”²²

Government Interventions

Open Market Operations and Monetary Policy²³

Since the fall of 2007, the Fed has made aggressive use of its monetary policy tools: cutting the federal funds rate target six times, including dramatic cuts of 75 basis points (0.75%) in January and March of 2008, and using its open market operations to inject liquidity into the banking system. Early cuts appeared aimed specifically at financial markets, but more recently, as the Fed has explicitly recognized that market conditions have become a drag on real economic activity, the distinction between actions aimed at restoring financial stability and those aimed at macroeconomic stimulus has become blurred, if it exists at all. After holding the rate steady for six months, the Fed cut rates twice in October 2008, by 50 basis points each time.

The Discount Window

In addition to open market operations, the Fed can provide liquidity by lending to individual banks through its discount window. Eligible banks can borrow short-term (usually overnight) directly from the central bank. Whereas open market operations target the system as a whole, discount lending provides support to particular banks with a need for liquidity. Another distinction is that discount window borrowings can be collateralized using a broader range of assets than open market transactions, where the only acceptable collateral is U.S. Treasury or agency securities.²⁴

On August 10, 2007, in its first public response to worsening financial conditions, the Fed announced a 50 basis point cut in the discount rate. (The Federal Funds rate was not cut until the next regularly-scheduled meeting of the Federal Open Market Committee in September 2007.)

A limitation of discount lending is that banks do not like to use it. Borrowing at the discount window may send a signal to the markets that a bank has liquidity problems. In an environment like that of late 2007, when interbank lending was already constrained by credit risk fears, the perceived costs of such a perception of financial weakness rise. To overcome the “stigma” of the discount window, the Fed introduced a new method for providing liquidity, the Term Auction Facility.

²² “Central Banks’ Action Is Welcome But Long-Term Rethink Is Needed,” *The Banker*, January 1, 2008.

²³ For a more detailed overview of the Fed’s actions, see CRS Report RL34427, *Financial Turmoil: Federal Reserve Policy Responses*, by Marc Labonte.

²⁴ Agency bonds are those issued by government-sponsored enterprises like Fannie Mae and Freddie Mac.

On March 11, 2008, the Fed took a highly unusual step: it expanded access to the discount window to primary dealers in U.S. Treasury securities. The primary dealers include large securities firms, like Merrill Lynch and Morgan Stanley, which the Fed did not regulate. (Since March 2008, all of the major U.S. investment banks have either merged with commercial banks, failed, or voluntarily placed themselves under Fed supervision.)

Term Auction Facility (TAF)

Despite the Fed's efforts to restore liquidity using its standard tools, markets continued to be tight. In December 2007, the Fed, together with the central banks of Canada, Britain, the European Union, and Switzerland, announced "measures designed to address elevated pressures in short-term funding markets."²⁵

The Term Auction Facility (TAF) has conducted a series of auctions of short-term loan funds to banks, accepting as collateral the same wide variety of assets that can be used to secure discount window borrowing. Auctions involve a fixed amount of funds, at a rate to be determined by competitive bidding. Since December, the TAF has held numerous auctions, and generally about 60 to 75 financial institutions have participated. TAF funds are loaned for periods of 28 to 35 days. The initial amount of funds provided to the bidding banks was \$40 billion in December 2007, but the size of the auctions increased in 2008.

Since April 2008, the Fed has continued to operate the TAF; the total amount of loans outstanding at the end of October 2008 was about \$200 billion. In November, completed and planned auctions total \$600 billion.

The TAF program — and efforts to restore liquidity to the banking system generally — raise certain questions. If the current financial situation is fundamentally a reaction to a period of too-easy access to credit and of excess liquidity, is providing more liquidity the appropriate response? If market discipline operates by forcing banks to absorb losses and shrink their balance sheets, do the Fed's actions to expand credit prolong the adjustment process? Provision of liquidity lowers interest rates, which is good for borrowers and for interest-sensitive economic sectors such as housing, but not for savers, because rates of return on conservative investments like bank CDs and money market funds are depressed. It could be argued that the Fed appears to be rescuing those who caused the problem at the expense of others who had nothing to do with it.

Others question the efficacy of the mechanism: supplying liquidity to banks does not automatically translate into more lending.²⁶ If elevated credit risk concerns are what is causing tight credit markets, liquidity provision may be the equivalent of "pushing on a string."

²⁵ "Federal Reserve Actions," Press Release, December 12, 2007.

²⁶ See, e.g., Steven Sloan, "Fed Pushes Harder, But Sentiment Isn't Shifting," *American Banker*, vol. 178, March 10, 2008, p. 1.

Treasury's "Super-SIV" Proposal

In the fall of 2007, when public attention focused on SIVs that were suddenly unable to find buyers for asset-backed commercial paper, a number of large banks met with Treasury officials and designed a financial structure to alleviate SIV funding problems. They proposed that a consortium of private banks create a "Master Liquidity Enhancement Conduit" (MLEC), to be capitalized entirely by the banks, which would buy assets from existing SIVs and fund these purchases in exactly the same way that the SIVs had done in the past: by issuing short-term commercial paper. The expectation was that commercial paper issued by the MLEC would be viewed as safe because of the vast financial resources of the participating banks and because the Treasury had endorsed the plan (although MLEC's debt would not carry any formal government guarantee).

The MLEC concept was announced on October 15, 2007, in a joint press release from J.P. Morgan Chase, Bank of America, and Citigroup, which noted that the Treasury had facilitated the agreement.²⁷ (The Federal Reserve had no comment on the plan, then or later.) Negotiations proceeded over the following weeks and months, but although press reports suggested that agreement was near, in the end banks were unwilling to commit capital to the project. The apparent coup-de-grace was delivered on December 20, 2007, when the three largest Japanese banks declined to participate.²⁸ A few days later, the effort to launch the MLEC was abandoned.

There are two explanations for the failure of the MLEC proposal. First, it was not clear that the concept was economically viable. The underlying problem was that the mortgage-backed assets held by SIVs had lost value and might continue to lose value unless the housing market recovered. How would transferring those assets (and losses) to a "super-SIV" help? The assumption behind the MLEC proposal was that markets were in a state of panic and that prices of mortgage-backed assets at that time were below their fundamental values. If liquidity could be restored, the super-SIV could simply hold assets until markets stabilized and rational valuations returned, and make a profit. Meanwhile, the MLEC would have given the SIVs a better price than they could have found elsewhere, allowing the sponsoring banks and other investors to cap their losses, and avoiding a "fire sale" by desperate SIVs at the brink of insolvency, which would have driven values even lower, exacerbating the general financial situation and further roiling housing markets.

In retrospect, it appears that prospective MLEC participants found this assumption and scenario less persuasive than an alternative view: that mortgage assets were not necessarily priced below fundamental values, but might still have some distance to fall. In this analysis, the SIVs' problem was not one of liquidity, but of solvency, and the notion that they could be rescued at a profit was deemed to be unrealistic.

²⁷ "Global Banks Announce Plans for Major Liquidity Facility to Bolster Asset-Backed Commercial Paper Markets," *PR Newswire*, October 5, 2007.

²⁸ Atsuko Fukase, "Japanese Banks Balk at Aiding SIV Fund," *Wall Street Journal*, December 20, 2007, p. C9.

Second, as time went on, it became apparent that the SIVs did not in fact pose an acute threat to their sponsoring banks. By the end of 2007, over \$109 billion in SIV assets had been brought back onto the sponsoring banks' balance sheets, without triggering a solvency crisis in those banks.²⁹ SIV assets became simply one of many sources of financial pain.

With hindsight, the SIV issue may have been overstated in the fall of 2007. It was a serious problem, and contributed to perceptions of elevated credit and valuation risk that fed the general financial turmoil, but it was not the key to the entire systemic disturbance. Rather, SIVs were one of several trouble spots that may be more properly characterized as symptoms of an underlying problem, or set of problems.

Provision of New Capital to Financial Institutions

As noted above, when banks and other financial institutions suffer declines in the value of their capital, to maintain constant leverage ratios they must either shrink their balance sheets or raise new capital. From a regulatory perspective, the latter method is usually preferable, since it does not require that new lending be curtailed. For the government to bail out troubled financial institutions through an injection of public funds is rare, although many assume that certain large institutions are “too big to fail” — that is, that the failure of such an institution could have adverse systemic consequences so severe that the government would have no choice but to intervene. The Treasury and the Federal Reserve officially deny that any such policy exists, because the moral hazard issue — which (as discussed above) may be a secondary effect of the Fed's liquidity support programs — is very clear here. If institutions believe they will be rescued from insolvency, they will take imprudent risks: the calculus becomes “Heads, I win; tails, the taxpayers lose.”

Although several major financial institutions experienced severe financial stress in 2007, there were no major failures that required the U.S. government to step in to prevent a spectacular collapse. In fact, troubled U.S. institutions were able to raise significant amounts of new capital. Much of this money — over \$30 billion by one estimate³⁰ — has come from government sources, but not the American government. Instead, sovereign wealth funds operated by China, Singapore, Abu Dhabi, and other countries have taken large equity stakes in Citigroup, Merrill Lynch, Morgan Stanley, and other firms, including leading European financial institutions.

While some find sovereign wealth fund investment to be problematic³¹ and are uneasy at the prospect of foreign ownership of substantial shares of key Western

²⁹ The exact total is unknown. The \$109 billion figure represents announced transactions by five banks: Citigroup (\$49 billion), HSBC (\$45 billion), Rabobank (\$7.6 billion), Societe General (\$4.3 billion), and Standard Chartered (\$3 billion). See “Bringing It All Back Home,” *American Banker*, vol. 172, December 17, 2007, p. 1.

³⁰ Gillian Tett, “Sovereign funds face growing US pressure to address market fears,” *Financial Times*, January 24, 2008, p. 1.

³¹ See CRS Report RL34336, *Sovereign Wealth Funds: Background and Policy Issues for Congress*, by Martin A. Weiss.

financial institutions, there is little doubt that such investment has eased the adjustment process for the recipients and mitigated the systemic (and perhaps macroeconomic) impact of market turmoil. It is not known whether U.S. government officials played a role in soliciting these capital contributions.

Bear Stearns.³² In 2008, the “too-big-to-fail” doctrine was put to the test, and various forms of government intervention were employed to prevent the disorderly liquidations of several major financial institutions.

On Thursday, March 13, 2008, it became known that the Federal Reserve had extended credit to Bear Stearns, a large investment bank whose liquidity problems had driven it to the brink of collapse. As market perceptions of Bear Stearns’ weakness grew, it became unable to borrow and its customers sought to retrieve their invested funds. The Fed was unwilling to allow the firm to collapse, since a liquidation would have meant the dumping of billions of dollars in mortgage-backed and other securities on the market, at a time when demand was low. The resulting fall in prices would have exacerbated the balance sheet problems of other institutions, perhaps triggering further collapses.

Over that weekend, the Fed worked with J.P. Morgan Chase to work out an agreement by which Morgan would acquire Bear. In order for the deal to proceed, the Fed had to purchase a pool of assets that Bear valued at \$30 billion, but which J.P. Morgan viewed as too risky to take onto its own balance sheet. If those assets ultimately prove to be worth less than \$30 billion, the taxpayers will suffer a loss equal to the difference.³³ The final sale price was \$10 per share (paid in J.P. Morgan stock), a remarkable plunge from the end of 2007, when Bear’s financial statements reported a book value of \$80 per share, and from January 2007, when the shares traded at a high of \$172.61.

In the wake of the Bear Stearns rescue, the Fed was criticized for widening the financial “safety net” to include a firm that was neither insured by the Federal Deposit Insurance Corporation nor subject to the oversight of the Fed or any other banking agency. Bear Stearns was widely considered to have been among the most aggressive and reckless speculators in the subprime market.

Fannie Mae and Freddie Mac.³⁴ On September 7, 2008, the Federal Housing Finance Agency (FHFA) placed Fannie Mae and Freddie Mac, two government-sponsored enterprises (GSEs) that play a critical role in the U.S. home mortgage market, in conservatorship. As conservator, the FHFA has full powers to control the assets and operations of the firms. Dividends to common and preferred shareholders are suspended, but the Treasury has put in place a set of financing agreements to ensure that the GSEs remain solvent and continue to meet their

³² See CRS Report RL34420, *Bear Stearns: Crisis and ‘Rescue’ for a Major Provider of Mortgage-Related Products*, by Gary Shorter.

³³ J.P. Morgan Chase agreed to absorb the first billion dollars in losses, limiting taxpayer exposure to \$29 billion.

³⁴ See CRS Report RS22950, *Fannie Mae and Freddie Mac in Conservatorship*, by Mark Jickling.

obligations to holders of bonds that they have issued or guaranteed. This means that the U.S. taxpayer now stands behind about \$5 trillion of GSE-issued debt. This step was taken because a default by either of the two firms, which have been battered by the downturn in housing and credit markets, could have caused severe disruptions in global financial markets, made home mortgages more difficult and expensive to obtain, and had negative repercussions throughout the economy.

Like Bear Stearns, Fannie and Freddie insisted up to the last minute that they were well-capitalized and liquid. In the context of plunging stock prices and doubts about creditworthiness, however, the firms were unable to raise capital by any of the normal means. If they sold assets, the deleveraging cycle described above applied: they would have depressed the prices of mortgage loans and MBSs still further, worsening both their own balance sheet problems and those of many other financial firms. They could not use retained earnings to bolster capital because their operations had not turned a profit since 2006. Finally, rapidly falling share prices made it all but impossible to raise capital by selling new equity or common stock.

Treasury and FHFA recognized that falling values of home mortgage loans and related bonds — the only investments that the GSE charters permit them to make — meant that the two firms were effectively insolvent. Even though Fannie and Freddie maintained access to the debt markets (albeit at higher-than-usual interest rates), their inability to raise new capital cast doubts on their long-term viability. If their interest costs continued to rise, and the value of (and their income from) mortgage assets kept falling, they were doomed to collapse. Against this backdrop, the federal regulator concluded that “the companies cannot continue to operate safely and soundly and fulfill their critical public mission, without significant action” to address their financial weaknesses.³⁵

In exchange for its promise to provide new capital — Treasury will buy preferred stock as needed to ensure that both firms maintain a positive net worth — the government received warrants for 79.9% of equity in Fannie and Freddie, making it the majority owner of the two GSEs.

AIG. On September 16, 2008, the Fed announced, after consultation with the Treasury Department, that it would provide a credit line up to \$85 billion to American International Group. AIG, in addition to being one of the largest providers of traditional lines of insurance, was a leading participant in the market for credit default swaps (CDS), instruments that are linked to corporate credit conditions.³⁶ In the aftermath of the Lehman Brothers bankruptcy and the Fannie and Freddie takeover, AIG was exposed to significant CDS losses. AIG was then downgraded by credit rating agencies, triggering immediate demands for billions of dollars in collateral payments related to CDS and other financial contracts.

³⁵ Federal Housing Finance Agency, “Statement of FHFA Director James B. Lockhart,” Press Release, September 7, 2008, p. 5.

³⁶ See CRS Report RS22932, *Credit Default Swaps: Frequently Asked Questions*, by Edward V. Murphy.

The Fed announced that AIG could borrow up to \$85 billion over a two year period. On September 18, the Fed announced that it had initially lent \$28 billion to AIG. The interest rate on the loan is 8.5 percentage points above the London Interbank Offered Rate (LIBOR), a rate that banks charge to lend to each other. In return, the government has received warrants that permit the government to take a 79.9% ownership stake in AIG.

During the weeks that followed, AIG's condition appeared to worsen. Demands for collateral and margin calls in response to losing positions increased, and it was found that speculative losses were not confined to the firm's unregulated, London-based trading unit, but had struck the regulated insurers as well. On October 9, the company borrowed an additional \$38 billion from the Fed.

In November 2008, the Treasury announced that it was purchasing \$40 billion in AIG preferred stock, pursuant to the Troubled Assets Relief Program (TARP) created by the Emergency Economic Stabilization Act (P.L. 110-343). The funds were to be used to restructure AIG's loan from the Fed. Total federal assistance to AIG now exceeds \$150 billion.

The \$700 Billion Troubled Assets Relief Program (P.L. 110-343).

Despite the steps taken to provide liquidity and prevent the failure of systemically important institutions, financial conditions worsened in the fall of 2008. During the week of September 22, 2008, following the bankruptcy of Lehman Brothers, markets approached full-blown panic. Investors pulled billions of dollars out of money market funds, normally considered very low-risk investments, and rushed to safety, driving the yields on Treasury bills to near zero. To the Fed and Treasury, this was a sign that the crisis had reached a new level: if financial institutions and investors viewed Treasury securities at zero percent as a good investment, who would be willing to extend credit to households and businesses? In other words, the possibility that credit markets would "freeze up," with devastating consequences to the real economy, now seemed to be at hand.

On Thursday, September 25, Chairman Bernanke and Secretary Paulson presented a proposal to leaders of Congress. They asked for authority to purchase up to \$700 billion of troubled mortgage-related assets. Behind the plan lay the conclusion that the normal market self-stabilizing processes were not resolving, and would not resolve, the balance sheet problems faced by many institutions. Banks could not sell their mortgage-related assets except at fire sale prices that implied widespread insolvency throughout the financial system. Uncertainty about the fundamental value of those assets was disrupting interbank lending, as no one could judge the true condition of trading partners. The negative leverage spiral described above had taken hold, and severely constrained the ability of financial institutions to raise capital in the markets.

Waiting for asset values to recover as the housing market improved was no longer an attractive option, given the possibility of a general collapse of lending to households and businesses. The \$700 billion rescue plan proposed replacing the case-by-case approach to interventions in the financial markets that had prevailed from summer 2007 through summer 2008 with a systemic program to improve the balance sheets of any institution that was holding mortgage-related assets. The

government, better positioned than private firms to bear long-term risks of uncertain magnitude, would pay cash in exchange for troubled assets. The hope was that once troubled MBS no longer raised doubts about the reliability of banks' balance sheet figures, credit risk fears would subside and normal lending flows will resume.

The Troubled Assets Relief Program (TARP) was enacted on October 3, 2008, as part of the Emergency Economic Stabilization Act (P.L. 110-343). Asset purchases were expected to begin in about one month.

In fact, the TARP funds have been used not to purchase troubled mortgage-related assets, but to inject capital directly into banks via purchases of newly-issued preferred stock. On October 29, Treasury announced the first set of purchases: preferred stock (with warrants to acquire common stock) from nine large financial institutions³⁷ in exchange for \$115 billion. On November 14, a second set of capital injections was announced, involving 21 banks. In addition, as noted above, \$40 billion in TARP funds went to AIG.

The Treasury continues to accept applications from financial institutions for TARP funding.³⁸

Increases in Government Guarantees and Insurance

In September 2008, during the panic that followed the bankruptcy of Lehman Brothers, there were massive withdrawals from money market funds. Like banks, money market funds face liquidity risk. They can only raise money by selling assets, but those sales themselves may depress assets prices further, leading to more demand for redemptions, and so on.

To stabilize the funds, the Treasury established a Temporary Guarantee Program, using the assets in a fund for foreign exchange rate stabilization. Under this program, the U.S. Treasury will guarantee to investors that they will receive \$1 for each money market fund share held as of close of business on September 19, 2008. To participate in the program, eligible funds must pay a fee and sign up for the program.

In response to the crisis, the Federal Deposit Insurance Corporation (FDIC) also increased the range and amount of assets it guarantees. The TARP legislation raised the insurance ceiling for individual bank accounts from \$100,000 to \$250,000.

On October 14, 2008, the FDIC announced a new program — the Temporary Liquidity Guarantee Program — to strengthen confidence and encourage liquidity in the banking system by guaranteeing newly issued senior unsecured debt of banks, thrifts, and certain holding companies, and by providing full coverage of non-interest bearing deposit transaction accounts, regardless of dollar amount.

³⁷ Bank of America, Bank of New York Mellon, Citigroup, Goldman Sachs, JP Morgan Chase, Morgan Stanley, State Street, Wells Fargo, and Merrill Lynch.

³⁸ For news about TARP transactions, see [<http://www.ustreas.gov/initiatives/eesa/>].

Commercial Paper

On October 7, 2008, the Fed announced that it was using its emergency authority under Section 13(3) of the Federal Reserve Act to establish a Commercial Paper Funding Facility. The facility will purchase commercial paper — short-term debt obligations used by a variety of businesses to fund their short-term operational cash needs — directly from the issuing corporations to ensure that this source of credit does not dry up. The initiative was another sign that credit conditions had not improved.

By the end of October, the Fed had purchased more than \$100 billion in commercial paper.

Citigroup

On November 23, 2008, the Fed and Treasury announced a rescue package for Citigroup, the second largest U.S. bank.³⁹ As part of the agreement, Treasury and the FDIC will provide protection against the possibility of unusually large losses on an asset pool of approximately \$306 billion of loans and securities backed by residential and commercial real estate (and derivatives related to such assets), which will remain on Citigroup's balance sheet. Citigroup will absorb the first \$29 billion in losses on the pool; the government will then cover 90% of losses that exceed that figure.

As a fee for this arrangement, Citigroup will issue \$7 billion in preferred shares to the Treasury and FDIC. In addition and if necessary, the Federal Reserve stands ready to backstop residual risk in the asset pool through a non-recourse loan.

Finally, Treasury will invest \$20 billion in Citigroup from the Troubled Asset Relief Program in exchange for preferred stock with an 8% dividend to the Treasury. Citigroup will comply with enhanced executive compensation restrictions and implement the FDIC's mortgage modification program.

Policy Issues: Are Regulators' Tools Adequate?

This prolonged period of financial stress raises questions about the ability of regulators to monitor, prevent, or respond to market instability. Policy makers may consider a number of approaches.

Information

First, some observers believe that regulators lack comprehensive information about large areas of the markets. No federal agency has direct supervisory authority over hedge funds, nonbank lenders, over-the-counter derivatives trading, private equity funds, all of which demand liquidity and can become the trigger for systemic

³⁹ See: "Joint Statement by Treasury, Federal Reserve and the FDIC on Citigroup," online at [<http://www.fdic.gov/news/news/press/2008/pr08125.html>].

instability. When regulated firms create off-balance sheet entities, oversight becomes more difficult. According to Secretary Paulson, “regulators didn’t have clear enough visibility with what was going on in terms of these off-balance-sheet SIVs.”⁴⁰ Banking and securities laws could be amended to authorize regulators to require more disclosure and reporting from (1) currently unregulated firms and sectors and (2) about off-the-books activities of regulated firms.

U.S. financial regulation is divided among agencies specializing in single markets: futures, individual banking sectors, or securities. In today’s markets, however, firms’ activities regularly cross those lines. An integrated firm like Merrill Lynch or Citigroup files reports with half a dozen agencies — would a single, consolidated supervisor be better able to interpret this information and assess market conditions?

Others question whether regulators can be expected to monitor overall market conditions, when the current turmoil suggests that even market participants lack that capacity. The invention of new and complex derivative instruments and securities has been a major profit center in the financial industry for several decades. In other words, while transparency benefits regulators and public investors, opacity can be a source of income for market intermediaries and professional traders. The problem of hard-to-value assets and unverifiable trading models is likely to persist.

Another view is that regulators had plenty of information indicating that trouble was imminent, but failed to take adequate preventive measures. According to Martin Feldstein, even though “the Fed’s examiners have complete access to all of the transactions of the banks that they supervise [and] can also examine indirectly what nonbank financial institutions are doing,” the Fed failed to provide appropriate supervisory oversight for major money center banks, making such technical errors as understating liabilities associated with off-balance sheet activities and overstating the quality of bank asset values that were the result of the housing bubble.⁴¹ There is a natural tendency for regulators to share industry’s enthusiasm for the latest financial innovation or strategy, as long as it is generating profits that enable banks to meet capital requirements and maintain healthy levels of reserves. It is difficult, as Alan Greenspan put it, to be the one who takes away the punch bowl when the party is just getting started.⁴² Federal bank agencies addressed securitization and off-balance sheet finance more than a decade ago, but characterized them as useful risk management tools.⁴³

⁴⁰ Carrick Mollenkamp, Deborah Solomon and Craig Karmin, “Call to Brave for \$100 Billion Rescue; Banks Seek Investors For Fund to Shore Up Commercial Paper,” *Wall Street Journal*, October 16, 2007, p. C1.

⁴¹ Martin Feldstein, “Our Economic Dilemma,” *Wall Street Journal*, February 20, 2008, p. A15.

⁴² According to some sources, he was quoting his predecessor, Chairman William McChesney Martin, Jr. The remark is attributed to every Fed chairman sooner or later.

⁴³ See, e.g., Office of the Comptroller of the Currency, “Interest Rate Risk Management: Questions and Answers,” OCC 95-28, June 20, 1995, at [<http://www.occ.treas.gov/ftp/>]

Speculation

Financial speculation presents another set of policy choices. In general, speculation is a benign and useful activity: speculators provide liquidity and help markets allocate resources efficiently. The current episode, however, illustrates that speculative excesses and errors can cause liquidity to dry up and disrupt markets.

Successful speculation rewards risk-taking. Recent developments in finance make it possible to unbundle the risks embedded in traditional financial instruments. A mortgage, for example, carries credit risk, interest rate risk, and prepayment risk, but with derivatives and CDOs, each of these risks can be disaggregated and made the basis of a financial bet. Increasingly, speculators identify financial propositions with a high probability of making a small profit, and a very small chance of a large loss. The SIV model, for example, captured the spread between short-term and long-term rates, earning a modest return that was almost risk-free unless there were to be a major disruption in the commercial paper market, which was normally very large and liquid. The CDO market relies on the narrow spread between what homebuyers pay and what investors will pay for the identical mortgages repackaged. Using derivatives, it is possible to construct similar trades based on tiny variations in observed historical relationships among a multitude of economic variables.

Of course, a strategy that promises a small but seemingly predictable return does not appeal to most investment bankers: Treasury bills offer the same risk/reward characteristics. What the bankers do is add leverage: if they borrow a high multiple of their own capital and put those funds into the same trading position, the returns to their own capital are magnified. Of course, the potential losses are magnified to exactly the same degree. Then why is leveraged speculation attractive?

One answer, put forward by Raghuram Rajan, former chief economist of the International Monetary Fund, is that compensation structures reward short-term performance and ignore long-term risk.⁴⁴ That a strategy is likely to fail spectacularly every ten or twenty years is not a disincentive to the leveraged trader: he will probably receive several large annual bonuses before the bad year comes, and even then may keep his job, since many of his peers will probably have incurred similar losses. The CEO of Morgan Stanley, for example, received no bonus for 2007, but kept the \$40 million from the year before.⁴⁵ Rajan suggests that significant portions of bankers' pay could be held in escrow for long periods, and that losses be factored in before final disbursement.⁴⁶

⁴³ (...continued)
bulletin/95-28.txt].

⁴⁴ Raghuram Rajan, "Bankers' Pay is Deeply Flawed," *Financial Times*, January 9, 2008, p. 11.

⁴⁵ The firm wrote down the value of its assets by \$9.4 billion in the last quarter of 2007, but increased its year-end bonus pool by 18%.

⁴⁶ *Ibid.*

The combination of modern financial engineering and short-term incentives may distort or weaken market discipline and lead to excessive risk-taking. The costs of failed speculation are not always borne by the speculators themselves but may be widely distributed throughout the financial system and, in extreme cases, may fall upon the economy as a whole. Is there a case for more stringent regulation to restrain speculation or limit the potential damage from speculative losses?

Financial supervisors can impose higher capital and reserve requirements on regulated firms, and can control the amount of leverage such firms extend to their unregulated customers. Such controls would smooth out the peaks and troughs of financial industry returns: this would mean, in effect, putting a brake on periods of economic and financial expansion.

The degree of support for initiatives such as these among regulators and policy makers is likely to depend on how the current financial turmoil is resolved, and at what cost. Opposition to forms and degrees of regulation that would have seemed excessive before the crisis may be muted because the government has already established a major ownership position in the financial services industry.