Ben S Bernanke: Reflections on a year of crisis

Speech by Mr Ben S Bernanke, Chairman of the Board of Governors of the US Federal Reserve System, at the Federal Reserve Bank of Kansas City's Annual Economic Symposium, Jackson Hole, Wyoming, 21 August 2009.

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By the standards of recent decades, the economic environment at the time of this symposium one year ago was quite challenging. A year after the onset of the current crisis in August 2007, financial markets remained stressed, the economy was slowing, and inflation – driven by a global commodity boom – had risen significantly. What we could not fully appreciate when we last gathered here was that the economic and policy environment was about to become vastly more difficult. In the weeks that followed, several systemically critical financial institutions would either fail or come close to failure, activity in some key financial markets would virtually cease, and the global economy would enter a deep recession. My remarks this morning will focus on the extraordinary financial and economic events of the past year, as well as on the policy responses both in the United States and abroad.

One very clear lesson of the past year – no surprise, of course, to any student of economic history, but worth noting nonetheless – is that a full-blown financial crisis can exact an enormous toll in both human and economic terms. A second lesson – once again, familiar to economic historians – is that financial disruptions do not respect borders. The crisis has been global, with no major country having been immune.

History is full of examples in which the policy responses to financial crises have been slow and inadequate, often resulting ultimately in greater economic damage and increased fiscal costs. In this episode, by contrast, policymakers in the United States and around the globe responded with speed and force to arrest a rapidly deteriorating and dangerous situation. Looking forward, we must urgently address structural weaknesses in the financial system, in particular in the regulatory framework, to ensure that the enormous costs of the past two years will not be borne again.

September-October 2008: the crisis intensifies

When we met last year, financial markets and the economy were continuing to suffer the effects of the ongoing crisis. We know now that the National Bureau of Economic Research has determined December 2007 as the beginning of the recession. The U.S. unemployment rate had risen to 5-3/4 percent by July, about 1 percentage point above its level at the beginning of the crisis, and household spending was weakening. Ongoing declines in residential construction and house prices and rising mortgage defaults and foreclosures continued to weigh on the U.S. economy, and forecasts of prospective credit losses at financial institutions both here and abroad continued to increase. Indeed, one of the nation's largest thrift institutions, IndyMac, had recently collapsed under the weight of distressed mortgages, and investors continued to harbor doubts about the condition of the government-sponsored enterprises (GSEs) Fannie Mae and Freddie Mac, despite the approval by the Congress of open-ended support for the two firms.

Notwithstanding these significant concerns, however, there was little to suggest that market participants saw the financial situation as about to take a sharp turn for the worse. For example, although indicators of default risk such as interest rate spreads and quotes on credit default swaps remained well above historical norms, most such measures had declined from earlier peaks, in some cases by substantial amounts. And in early September, when the target for the federal funds rate was 2 percent, investors appeared to see little chance that the federal funds rate would be below 1-3/4 percent six months later. That is, as

of this time last year, market participants evidently believed it improbable that significant additional monetary policy stimulus would be needed in the United States.

Nevertheless, shortly after our last convocation, the financial crisis intensified dramatically. Despite the steps that had been taken to support Fannie Mae and Freddie Mac, their condition continued to worsen. In early September, the companies' regulator placed both into conservatorship, and the Treasury used its recently enacted authority to provide the firms with massive financial support.

Shortly thereafter, several additional large U.S. financial firms also came under heavy pressure from creditors, counterparties, and customers. The Federal Reserve has consistently maintained the view that the disorderly failure of one or more systemically important institutions in the context of a broader financial crisis could have extremely adverse consequences for both the financial system and the economy. We have therefore spared no effort, within our legal authorities and in appropriate cooperation with other agencies, to avert such a failure. The case of the investment bank Lehman Brothers proved exceptionally difficult, however. Concerted government attempts to find a buyer for the company or to develop an industry solution proved unavailing, and the company's available collateral fell well short of the amount needed to secure a Federal Reserve loan of sufficient size to meet its funding needs. As the Federal Reserve cannot make an unsecured loan, and as the government as a whole lacked appropriate resolution authority or the ability to inject capital, the firm's failure was, unfortunately, unavoidable. The Federal Reserve and the Treasury were compelled to focus instead on mitigating the fallout from the failure, for example, by taking measures to stabilize the triparty repurchase (repo) market.

In contrast, in the case of the insurance company American International Group (AIG), the Federal Reserve judged that the company's financial and business assets were adequate to secure an $85 billion line of credit, enough to avert its imminent failure. Because AIG was counterparty to many of the world's largest financial firms, a significant borrower in the commercial paper market and other public debt markets, and a provider of insurance products to tens of millions of customers, its abrupt collapse likely would have intensified the crisis substantially further, at a time when the U.S. authorities had not yet obtained the necessary fiscal resources to deal with a massive systemic event.

The failure of Lehman Brothers and the near-failure of AIG were dramatic but hardly isolated events. Many prominent firms struggled to survive as confidence plummeted. The investment bank Merrill Lynch, under pressure in the wake of Lehman's failure, agreed to be acquired by Bank of America; the major thrift institution Washington Mutual was resolved by the Federal Deposit Insurance Corporation (FDIC) in an assisted transaction; and the large commercial bank Wachovia, after experiencing severe liquidity outflows, agreed to be sold. The two largest remaining free-standing investment banks, Morgan Stanley and Goldman Sachs, were stabilized when the Federal Reserve approved, on an emergency basis, their applications to become bank holding companies.

Nor were the extraordinary pressures on financial firms during September and early October confined to the United States: For example, on September 18, the U.K. mortgage lender HBOS, with assets of more than $1 trillion, was forced to merge with Lloyds TSB. On September 29, the governments of Belgium, Luxembourg, and the Netherlands effectively nationalized Fortis, a banking and insurance firm that had assets of around $1 trillion. The same day, German authorities provided assistance to Hypo Real Estate, a large commercial real estate lender, and the British government nationalized another mortgage lender, Bradford and Bingley. On the next day, September 30, the governments of Belgium, France, and Luxembourg injected capital into Dexia, a bank with assets of more than $700 billion, and the Irish government guaranteed the deposits and most other liabilities of six large Irish financial institutions. Soon thereafter, the Icelandic government, lacking the resources to rescue the three largest banks in that country, put them into receivership and requested assistance from the International Monetary Fund (IMF) and from other Nordic governments.

In mid-October, the Swiss authorities announced a rescue package for UBS, one of the world's largest banks, that consisted of a capital injection and a purchase of assets.[1] The growing pressures were not limited to banks with significant exposure to U.S. or U.K real estate or to securitized assets. For example, unsubstantiated rumors circulated in late September that some large Swedish banks were having trouble rolling over wholesale deposits, and on October 13 the Swedish government announced measures to guarantee bank debt and to inject capital into banks.[2]

The rapidly worsening crisis soon spread beyond financial institutions into the money and capital markets more generally. As a result of losses on Lehman's commercial paper, a prominent money market mutual fund announced on September 16 that it had "broken the buck" – that is, its net asset value had fallen below $1 per share. Over the subsequent several weeks, investors withdrew more than $400 billion from so-called prime money funds.[3] Conditions in short-term funding markets, including the interbank market and the commercial paper market, deteriorated sharply. Equity prices fell precipitously, and credit risk spreads jumped. The crisis also began to affect countries that had thus far escaped its worst effects. Notably, financial markets in emerging market economies were whipsawed as a flight from risk led capital inflows to those countries to swing abruptly to outflows.

The policy response

Authorities in the United States and around the globe moved quickly to respond to this new phase of the crisis, although the details differed according to the character of financial systems. The financial system of the United States gives a much greater role to financial markets and to nonbank financial institutions than is the case in most other nations, which rely primarily on banks.[4] Thus, in the United States, a wider variety of policy measures was needed than in some other nations.

In the United States, the Federal Reserve established new liquidity facilities with the goal of restoring basic functioning in various critical markets. Notably, on September 19, the Fed announced the creation of a facility aimed at stabilizing money market mutual funds, and the Treasury unveiled a temporary insurance program for those funds. On October 7, the Fed announced the creation of a backstop commercial paper facility, which stood ready to lend against highly rated commercial paper for a term of three months.[5] Together, these steps

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[1] Of course, these interventions were not the first of the crisis. For example, in July and August of 2007, two German banks that had relied heavily on market funding through asset-backed commercial paper (ABCP) conduits – IKB and Sachsen LB – received assistance from public-sector owners to cope with severe funding pressures. In September 2007, Northern Rock, a large mortgage lender that relied heavily on securitizations for funding, was nationalized by U.K. authorities after experiencing a run by retail depositors. In February 2008, West LB – another German bank with large ABCP conduits – received protection against losses from its owners, including the state of North Rhine-Westphalia. And in March 2008, the U.S. Treasury and the Federal Reserve facilitated the acquisition of the investment bank Bear Stearns by JPMorgan Chase & Co.

[2] Throughout these remarks, where examples are given, they represent only a selection of instances, not an exhaustive list of all the relevant cases.

[3] Prime money funds hold a variety of instruments, with commercial paper and bank obligations typically accounting for the majority of their assets.

[4] For example, most financing of automobile purchases was provided through nonbank channels, and such channels began shutting down in September and October of 2008.

[5] More precisely, in the Commercial Paper Funding Facility (CPFF), the Fed lends to a special purpose vehicle that, in turn, purchases highly rated three-month commercial paper directly from eligible issuers. On October 21, the Fed also announced the creation of the Money Market Investor Funding Facility, or MMIFF, which was intended to provide a source of backup liquidity to U.S. money market mutual funds and certain other money market investors. Given the improvement in short-term markets brought about by the Asset-Backed Commercial Paper Money Market Mutual Fund Liquidity Facility (AMLF), the CPFF, and the Treasury guarantee of money market funds, the MMIFF never had to be tapped. Nonetheless, market participants

helped stem the massive outflows from the money market mutual funds and stabilize the commercial paper market.

During this period, foreign commercial banks were a source of heavy demand for U.S. dollar funding, thereby putting additional strain on global bank funding markets, including U.S. markets, and further squeezing credit availability in the United States. To address this problem, the Federal Reserve expanded the temporary swap lines that had been established earlier with the European Central Bank (ECB) and the Swiss National Bank, and established new temporary swap lines with seven other central banks in September and five more in late October, including four in emerging market economies.[6] In further coordinated action, on October 8, the Federal Reserve and five other major central banks simultaneously cut their policy rates by 50 basis points.

The failure of Lehman Brothers demonstrated that liquidity provision by the Federal Reserve would not be sufficient to stop the crisis; substantial fiscal resources were necessary. On October 3, on the recommendation of the Administration and with the strong support of the Federal Reserve, the Congress approved the creation of the Troubled Asset Relief Program, or TARP, with a maximum authorization of $700 billion to support the stabilization of the U.S. financial system.

Markets remained highly volatile and pressure on financial institutions intense through the first weeks of October. On October 10, in what would prove to be a watershed in the global policy response, the Group of Seven (G-7) finance ministers and central bank governors, meeting in Washington, committed in a joint statement to work together to stabilize the global financial system. In particular, they agreed to prevent the failure of systemically important financial institutions; to ensure that financial institutions had adequate access to funding and capital, including public capital if necessary; and to put in place deposit insurance and other guarantees to restore the confidence of depositors.[7] In the following days, many countries around the world announced comprehensive rescue plans for their banking systems that built on the G-7 principles. To stabilize funding, during October more than 20 countries expanded their deposit insurance programs, and many also guaranteed nondeposit liabilities of banks. In addition, amid mounting concerns about the solvency of the global banking system, by the end of October more than a dozen countries had announced plans to inject public capital into banks, and several announced plans to purchase or guarantee bank assets. The comprehensive U.S. response, announced on October 14, included capital injections into both large and small banks by the Treasury; a program which allowed banks and bank holding companies, for a fee, to issue FDIC-guaranteed senior debt; the extension of deposit insurance to all noninterest-bearing transactions deposits, of any size; and the Federal Reserve's continued commitment to provide liquidity as necessary to stabilize key financial institutions and markets.[8]

This strong and unprecedented international policy response proved broadly effective. Critically, it averted the imminent collapse of the global financial system, an outcome that seemed all too possible to the finance ministers and central bankers that gathered in

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reported that the facility's existence helped reassure investors that ample liquidity would be available in case of further disruptions in the money markets.

6 A crucial feature of these lines is that the Federal Reserve's counterparties are the foreign central banks, which are governmental entities, not the private-sector entities to which those central banks might lend in turn. Accordingly, the Fed bears little risk through these arrangements.

7 Notably, these commitments were reaffirmed on October 11 in communiqués issued by the International Monetary and Financial Committee of the Board of Governors of the IMF and by the Group of Twenty finance ministers and central bank governors.

8 The FDIC's guarantee program complemented a temporary increase in the deposit insurance limit, from $100,000 to $250,000 per account, passed by the Congress as part of the Emergency Economic Stabilization Act, the bill that created the TARP.

Washington on October 10. However, although the intensity of the crisis moderated and the risk of systemic collapse declined in the wake of the policy response, financial conditions remained highly stressed. For example, although short-term funding spreads in global markets began to turn down in October, they remained elevated into this year. And, although generalized pressures on financial institutions subsided somewhat, government actions to prevent the disorderly failures of individual, systemically significant institutions continued to be necessary. In the United States, support packages were announced for Citigroup in November and Bank of America in January. Broadly similar support packages were also announced for some large European institutions, including firms in the United Kingdom and the Netherlands.[9]

Although concerted policy actions avoided much worse outcomes, the financial shocks of September and October nevertheless severely damaged the global economy – starkly illustrating the potential effects of financial stress on real economic activity. In the fourth quarter of 2008 and the first quarter of this year, global economic activity recorded its weakest performance in decades. In the United States, real GDP plummeted at nearly a 6 percent average annual pace over those two quarters – an even sharper decline than had occurred in the 1981-82 recession. Economic activity contracted even more precipitously in many foreign economies, with real GDP dropping at double-digit annual rates in some cases. The crisis affected economic activity not only by pushing down asset prices and tightening credit conditions, but also by shattering household and business confidence around the world.

In response to these developments, the Federal Reserve expended the remaining ammunition in the traditional arsenal of monetary policy, bringing the federal funds rate down, in steps, to a target range of 0 to 25 basis points by mid-December of last year. It also took several measures to further supplement its traditional arsenal. In particular, on November 25, the Fed announced that it would purchase up to $100 billion of debt issued by the housing-related GSEs and up to $500 billion of agency-guaranteed mortgage-backed securities, programs that were expanded substantially and augmented by a program of purchases of Treasury securities in March.[10] The goal of these purchases was to provide additional support to private credit markets, particularly the mortgage market. Also on November 25, the Fed announced the creation of the Term Asset-Backed Securities Loan Facility (TALF). This facility aims to improve the availability and affordability of credit for households and small businesses and to help facilitate the financing and refinancing of commercial real estate properties. The TALF has shown early success in reducing risk spreads and stimulating new securitization activity for assets included in the program.

Foreign central banks also cut policy rates to very low levels and implemented unconventional monetary measures. For example, the Bank of Japan began purchasing commercial paper in December and corporate bonds in January. In March, the Bank of England announced that it would purchase government securities, commercial paper, and corporate bonds, and the Swiss National Bank announced that it would purchase corporate bonds and foreign currency. For its part, the ECB injected more than €400 billion of one-year funds in a single auction in late June. In July, the ECB began purchasing covered bonds, which are bonds that are issued by financial institutions and guaranteed by specific asset

[9] On January 26, the Dutch government announced that it would provide ING Group, a large banking and insurance firm, with loss protection on some of its assets, following up a €10 billion capital injection on October 19. Shortly afterward, the U.K. Treasury announced packages for the Royal Bank of Scotland (RBS) and for Lloyds Banking Group that included loss protection on assets and, in the case of RBS, a capital injection.

[10] In March, the Federal Reserve announced that it would purchase up to $300 billion of longer-term Treasury securities and raised the caps on other purchases to $200 billion for the direct debt of the housing-related GSEs and $1.25 trillion for agency-guaranteed mortgage-backed securities.

pools. Actions by central banks augmented large fiscal stimulus packages in the United States, China, and a number of other countries.

On February 10, Treasury Secretary Geithner and the heads of the federal banking agencies unveiled the outlines of a new strategy for ensuring that banking institutions could continue to provide credit to households and businesses during the financial crisis. A central component of that strategy was the exercise that came to be known as the bank stress test.[11] Under this initiative, the banking regulatory agencies undertook a forward-looking, simultaneous evaluation of the capital positions of 19 of the largest bank holding companies in the United States, with the Treasury committing to provide public capital as needed. The goal of this supervisory assessment was to ensure that the equity capital held by these firms was sufficient – in both quantity and quality – to allow those institutions to withstand a worse-than-expected macroeconomic environment over the subsequent two years and yet remain healthy and capable of lending to creditworthy borrowers. This exercise, unprecedented in scale and scope, was led by the Federal Reserve in cooperation with the Office of the Comptroller of the Currency and the FDIC. Importantly, the agencies' report made public considerable information on the projected losses and revenues of the 19 firms, allowing private analysts to judge for themselves the credibility of the exercise. Financial market participants responded favorably to the announcement of the results, and many of the tested banks were subsequently able to tap public capital markets.

Overall, the policy actions implemented in recent months have helped stabilize a number of key financial markets, both in the United States and abroad. Short-term funding markets are functioning more normally, corporate bond issuance has been strong, and activity in some previously moribund securitization markets has picked up. Stock prices have partially recovered, and U.S. mortgage rates have declined markedly since last fall. Critically, fears of financial collapse have receded substantially. After contracting sharply over the past year, economic activity appears to be leveling out, both in the United States and abroad, and the prospects for a return to growth in the near term appear good. Notwithstanding this noteworthy progress, critical challenges remain: Strains persist in many financial markets across the globe, financial institutions face significant additional losses, and many businesses and households continue to experience considerable difficulty gaining access to credit. Because of these and other factors, the economic recovery is likely to be relatively slow at first, with unemployment declining only gradually from high levels.

Interpreting the crisis: elements of a classic panic

How should we interpret the extraordinary events of the past year, particularly the sharp intensification of the financial crisis in September and October? Certainly, fundamentals played a critical role in triggering those events. As I noted earlier, the economy was already in recession, and it had weakened further over the summer. The continuing dramatic decline in house prices and rising rates of foreclosure raised serious concerns about the values of mortgage-related assets, and thus about large potential losses at financial institutions. More broadly, investors remained distrustful of virtually all forms of private credit, especially structured credit products and other complex or opaque instruments.

At the same time, however, the events of September and October also exhibited some features of a classic panic, of the type described by Bagehot and many others.[12] A panic is a generalized run by providers of short-term funding to a set of financial institutions, possibly resulting in the failure of one or more of those institutions. The historically most familiar type

[11] Officially, it was called the Supervisory Capital Assessment Program, or SCAP.

[12] See Walter Bagehot ([1873] 1897), *Lombard Street: A Description of the Money Market* (New York: Charles Scribner's Sons).

of panic, which involves runs on banks by retail depositors, has been made largely obsolete by deposit insurance or guarantees and the associated government supervision of banks.[13] But a panic is possible in any situation in which longer-term, illiquid assets are financed by short-term, liquid liabilities, and in which suppliers of short-term funding either lose confidence in the borrower or become worried that other short-term lenders may lose confidence.[14,15] Although, in a certain sense, a panic may be collectively irrational, it may be entirely rational at the individual level, as each market participant has a strong incentive to be among the first to the exit.

Panics arose in multiple contexts last year. For example, many financial institutions, notably including the independent investment banks, financed a portion of their assets through short-term repo agreements. In repo agreements, the asset being financed serves as collateral for the loan, and the maximum amount of the loan is the current assessed value of the collateral less a haircut. In a crisis, haircuts typically rise as short-term lenders attempt to protect themselves from possible declines in asset prices. But this individually rational behavior can set off a run-like dynamic: As high haircuts make financing portfolios more difficult, some borrowers may have no option but to sell assets into illiquid markets. These forced sales drive down asset prices, increase volatility, and weaken the financial positions of all holders of similar assets, which in turn increases the risks borne by repo lenders and thus the haircuts they demand.[16] This unstable dynamic was apparent around the time of the near-failure of Bear Stearns in March 2008, and haircuts rose particularly sharply during the worsening of the crisis in mid-September.[17] As we saw last fall, when a vicious funding spiral of this sort is at work, falling asset prices and the collapse of lender confidence may create financial contagion, even between firms without significant counterparty relationships. In such an environment, the line between insolvency and illiquidity may be quite blurry.

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[13] The Northern Rock episode in the United Kingdom may be seen as a counterexample, but in that case deposit insurance coverage was only partial.

[14] To be sure, there are good economic reasons for a maturity mismatch between assets and liabilities in the financial system, including allowing households flexibility in when to consume (see Douglas W. Diamond and Philip H. Dybvig (1983), "Bank Runs, Deposit Insurance, and Liquidity," Journal of Political Economy, vol. 91 (June), pp. 401-19). Moreover, short-term creditors can help to impose market discipline on financial institutions (see Charles W. Calomiris and Charles M. Kahn (1991), "The Role of Demandable Debt in Structuring Optimal Banking Arrangements," American Economic Review, vol. 81 (June), pp. 497-513; and Douglas W. Diamond and Raghuram G. Rajan (2001), "Liquidity Risk, Liquidity Creation, and Financial Fragility: A Theory of Banking," Journal of Political Economy, vol. 109 (April), pp. 287-327).

[15] Also, during a panic, financial firms concerned about funding are likely to hoard liquidity, further exacerbating the situation. See Douglas W. Diamond and Raghuram G. Rajan (2009), "Fear of Fire Sales and the Credit Freeze," NBER Working Paper Series 14925 (Cambridge, Mass.: National Bureau of Economic Research, April); and Zhiguo He and Wei Xiong (2009), "Dynamic Debt Runs)," unpublished paper, June 30, Princeton University, Princeton, N.J.

[16] See Markus K. Brunnermeier (2009), "Deciphering the Liquidity and Credit Crunch 2007-2008," *Journal of Economic Perspectives*, vol. 23 (Winter), pp. 77-100. This dynamic differed from the standard bank run in that investors did not completely withdraw funding. The reason for the difference lies in the nature of the lending contract. In a standard bank deposit contract, the price of deposits in terms of currency is fixed, and so depositors have no alternative to withdrawal when the value of deposits falls below the value of currency. For similar reasons, many investors in money market mutual funds withdrew all their funds when the redemption value exceeded the value of holding the fund. In contrast, in the case of repo lending, lenders have the alternative to withdrawal of varying the haircut they demand. There is a close analogy to the discounting of bank notes during the U.S. free banking era, as discussed by Gorton (see Gary Gorton (1996), "Reputation Formation in Early Bank Note Markets," *Journal of Political Economy*, vol. 104 (April), pp. 346-97). In either case, however, variations in the liquidity premium play an important role in the amount of funding that lenders are willing to provide against a given set of assets.

[17] See Gary B. Gorton and Andrew Metrick (2009), "Securitized Banking and the Run on Repo," Yale International Center for Finance Working Paper No. 14, July.

Panic-like phenomena occurred in other contexts as well. Structured investment vehicles and other asset-backed programs that relied heavily on the commercial paper market began to have difficulty rolling over their short-term funding very early in the crisis, forcing them to look to bank sponsors for liquidity or to sell assets.[18] Following the Lehman collapse, panic gripped the money market mutual funds and the commercial paper market, as I have discussed. More generally, during the crisis runs of uninsured creditors have created severe funding problems for a number of financial firms. In some cases, runs by creditors were augmented by other types of "runs" – for example, by prime brokerage customers of investment banks concerned about the funds they held in margin accounts. Overall, the role played by panic helps to explain the remarkably sharp and sudden intensification of the financial crisis last fall, its rapid global spread, and the fact that the abrupt deterioration in financial conditions was largely unforecasted by standard market indicators.

The view that the financial crisis had elements of a classic panic, particularly during its most intense phases, has helped to motivate a number of the Federal Reserve's policy actions.[19] Bagehot instructed central banks – the only institutions that have the power to increase the aggregate liquidity in the system – to respond to panics by lending freely against sound collateral.[20] Following that advice, from the beginning of the crisis the Fed (like other central banks) has provided large amounts of short-term liquidity to financial institutions. As I have discussed, it also provided backstop liquidity support for money market mutual funds and the commercial paper market and added significant liquidity to the system through purchases of longer-term securities. To be sure, the provision of liquidity alone can by no means solve the problems of credit risk and credit losses; but it can reduce liquidity premiums, help restore the confidence of investors, and thus promote stability. It is noteworthy that the use of Fed liquidity facilities has declined sharply since the beginning of the year – a clear market signal that liquidity pressures are easing and market conditions are normalizing.

What does this perspective on the crisis imply for future policies and regulatory reforms? We have seen during the past two years that the complex interrelationships among credit, market, and funding risks of key players in financial markets can have far-reaching implications, particularly during a general crisis of confidence. In particular, the experience has underscored that liquidity risk management is as essential as capital adequacy and credit and market risk management, particularly during times of intense financial stress. Both the Basel Committee on Banking Supervision and the U.S. bank regulatory agencies have recently issued guidelines for strengthening liquidity risk management at financial institutions. Among other objectives, liquidity guidelines must take into account the risks that inadequate liquidity planning by major financial firms pose for the broader financial system, and they must ensure that these firms do not become excessively reliant on liquidity support from the central bank.

But liquidity risk management at the level of the firm, no matter how carefully done, can never fully protect against systemic events. In a sufficiently severe panic, funding problems will almost certainly arise and are likely to spread in unexpected ways. Only central banks

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[18] See Daniel M. Covitz, Nellie Liang, and Gustavo Suarez (2009), "The Evolution of a Financial Crisis: Runs in the Asset-Backed Commercial Paper Market," unpublished paper, Board of Governors of the Federal Reserve System, Division of Research and Statistics, August. Moreover, the scale of these conduits and their vulnerability to runs contributed importantly to the liquidity panics globally as many of these programs were sponsored by non-U.S. banks (see Carlos O. Arteta, Mark Carey, Ricardo Correa, and Jason Kotter (2009), "Revenge of the Steamroller: ABCP as a Window on Risk Choices," unpublished paper, Board of Governors of the Federal Reserve System, Division of International Finance, May).

[19] See Brian F. Madigan (2009), "Bagehot's Dictum in Practice: Formulating and Implementing Policies to Combat the Financial Crisis," speech delivered at this symposium, sponsored by the Federal Reserve Bank of Kansas City, Jackson Hole, Wyo., August 21-23.

[20] See Bagehot, *Lombard Street*.

are well positioned to offset the ensuing sharp decline in liquidity and credit provision by the private sector. They must be prepared to do so.

The role of liquidity in systemic events provides yet another reason why, in the future, a more systemwide or macroprudential approach to regulation is needed.[21] The hallmark of a macroprudential approach is its emphasis on the interdependencies among firms and markets that have the potential to undermine the stability of the financial system, including the linkages that arise through short-term funding markets and other counterparty relationships, such as over-the-counter derivatives contracts. A comprehensive regulatory approach must examine those interdependencies as well as the financial conditions of individual firms in isolation.

Conclusion

Since we last met here, the world has been through the most severe financial crisis since the Great Depression. The crisis in turn sparked a deep global recession, from which we are only now beginning to emerge.

As severe as the economic impact has been, however, the outcome could have been decidedly worse. Unlike in the 1930s, when policy was largely passive and political divisions made international economic and financial cooperation difficult, during the past year monetary, fiscal, and financial policies around the world have been aggressive and complementary. Without these speedy and forceful actions, last October's panic would likely have continued to intensify, more major financial firms would have failed, and the entire global financial system would have been at serious risk. We cannot know for sure what the economic effects of these events would have been, but what we know about the effects of financial crises suggests that the resulting global downturn could have been extraordinarily deep and protracted.

Although we have avoided the worst, difficult challenges still lie ahead. We must work together to build on the gains already made to secure a sustained economic recovery, as well as to build a new financial regulatory framework that will reflect the lessons of this crisis and prevent a recurrence of the events of the past two years. I hope and expect that, when we meet here a year from now, we will be able to claim substantial progress toward both those objectives.

[21] See Ben S. Bernanke (2009), "Financial Reform to Address Systemic Risk," speech delivered at the Council on Foreign Relations, Washington, March 10.