ECONOMIC RESEARCH

Financial crisis in September 2008: Timeline and implications

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Amol Agrawal
+91 22 66177921
amol@idbigilts.com

It has been a year since the sub-prime crisis started unfolding (August 2007). The crisis has come in stages and whenever it looks the worst looks like being over, comes a fresh spate of bad news and crisis. Beginning September 2008, the crisis has taken a new turn with largest bailouts and largest bankruptcy in the history of finance. This paper reviews the developments and asks various questions learnt from the events.

Timeline

- **Freddie Mac/Fannie Mae takeover by government (September 7, 2008):** These entities were formed to create a mortgage market that would in turn enable people to buy their own homes. These entities though privately owned are called as Government Sponsored entities (GSEs). Their special legal status as GSEs, which includes tax and regulatory exemptions, enhances the perceived quality of the debt and mortgage-backed securities (MBSs) that they issue or guarantee and translates into a federal subsidy. So, though GSEs are privately owned, the yields on bonds issued by them are deemed to be less risky and carry a lower yield. The Congressional Budget Office in a 2001 study analyzed that the average spread, across all types of GSE debt securities, was 41 basis points, which is a big advantage. CBO estimated that only about half of the total subsidy provided to the GSEs gets passed on to homebuyers with the rest remaining on the balance-sheet. The need to reform this dubious ownership model has been debated numerous times in US forums but it was not reformed.

  The business model of GSEs is to buy mortgage loans from Banks and convert the mortgages into mortgage backed securities (MBS) and sell MBS to investors. The GSEs also provide guarantee to pay back these mortgages. These mortgages are in turn funded by issuing GSE bonds in debt markets. Because of the implicit government subsidy GSEs pay a lower yield on their debt. The GSEs make revenues for this intermediation activity between banks and MBS investors.

  As the mortgage markets expanded, the two GSEs assumed about US$ 5.4 trillion of MBS and debt outstanding, equivalent to US public debt and nearly half the entire MBS market in US. As the housing prices fell post sub-prime market crisis, there were questions of servicing these guaranteed bonds. This led to a possibility that two GSEs might become bankrupt and the result was a Fed/Treasury structured bailout.

  Under the bailout, the status of the 2 GSEs was placed under a 'Conservatorship' status (meaning custody) with the Federal Housing Finance Agency. Under conservatorship, both companies will continue working as before and its commitments will be paid with the support of Treasury. (See FHFA website for details).

- **Collapse of Investment bank giants (September 14-22, 2008):** The business models of i-banks came under pressure as the crisis turned into aliquidity crisis. The i-banks relied on short-term liabilities to fund their assets and were highly leveraged entities (average leverage ratio was noted at 30 much higher than commercial banks leverage of 10). So, they had much lesser capital to service in case of a fall in asset values. The i-banks had taken huge exposures to housing mortgage markets and were funding these assets by issuing short-term paper. As the crisis enfolded, the concerns over losses in asset positions increased and firms stopped lending to i-banks. As liquidity in the short term debt paper dried, the i-banks were straddled with huge losses. They had two options - either to sell assets or raise more capital.

Selling assets during distressed times leads to fire sales, lowering prices for the firm's assets. Moreover, as values of asset position declines, the concerns over firms insolvency increases. This worsens the already weak positions of the firms. Hence, raising capital is the only optimal solution and I-banks tried raising capital from various sources. They were successful initially in early days of crisis. But as the crisis worsened, they were unable to raise additional capital and questions over their insolvency grew.

The regulatory experiences with I-banks were different. Fed bailed out bear Stearns in March 2008 and it was hailed as an unprecedented move. It was said that it was a one time experience and the authorities were unprepared. To avoid future crisis, Fed started separate liquidity support facilities for I-banks called Primary Dealer Credit Facility (PDCF) and Term Securities Lending Facility (TSLF). PDCF is an overnight loan facility that provides funding to primary dealers in exchange for a specified range of eligible collateral. TSLF is a weekly loan facility which offers Treasuries in exchange for other program collateral. TSLF was initiated as market participants were skeptical to lend against collateral other than Treasuries. In the recent update, Fed has expanded the collteral that can be exchanged for Treasuries to investment-grade debt securities as well. The auctions are also being held more frequently now.

However, these weren't found enough and I-banks continued to bleed and needed more liquidity. Lehman filed for bankruptcy as it could neither infuse capital nor find a buyer for its business. However, Merrill Lynch could find a buyer in form of Bank of America. Goldman and Morgan Stanley were converted into Bank Holding companies (BHC) and would now be regulated under Fed. The bizarre intervention in I-banking reaises numerous questions? Why was Lehman allowed to fail? Some say Fed and Treasury realised the moral hazard problem was getting too big or liquidity support. asked was too large. If moral hazard was getting too big, why did Fed convert Goldman Sachs and Morgan Stanley to a BHC? Why the preferential treatment to the two and not Lehman? (these questions are discussed in detail below)

- **Collapse of AIG (September 16, 2008):** AIG is an insurance firm but had turned into a financial firm over the years. An insurance firm is supposed to deploy the monies from the public in safest financial assets but AIG had other ideas. AIG had four divisions and performance in each division in Q2 2008 is as follows:

Table 1: AIG's performance in Q2 2008

General Insurance	$ 0.8
Financial Services	$ (-5.9)
Life Insurance & retirement services	$ (-2.4)
Asset Management	$ (-0.3)
Total	$ (-5.4)

Source: IDBI Gilts Limited

The main troubles are in 2 divisions: financial services and Life Insurance & retirement services. Financial services losses include $ 5.6 billion of unrealized market valuation loss on CDS portfolio. AIG had written huge amounts of CDS in its financial services business. Writers of CDS are required to post additional collateral to the buyer, if there are concerns over the credit risk of the writer. As AIG's performance dipped, the credit rating agencies downgraded AIG and this led to additional demand of collateral. And as markets had frozen AIG could not have posted the collateral leading to a big strain on AIG's financials.

Finally, Treasury and Federal Reserve had to bail-out AIG. The US government will now own 79.9% of AIG's equity and Fed would provide a liquidity support of USD 85 billion. The AIG facility has a 24-month term. Interest will accrue on the outstanding balance at a rate of three-month Libor plus 850 basis points.

- **Money Market Mutual Funds (16 September 2008- ??) :** The crisis then took another ugly turn and impacted what was considered as a very safe investment avenue -Money Market Mutual Funds. These funds invest the proceeds in very short-term liquid debt paper like certificates of deposit, Treasury securities etc. These funds are required to maintain a NAV of USD 1. The fund's holdings are marked to market every day and the current market value of all holdings is added up, as if they were being sold. Anything above $1 per share basically passes back to the shareholders as interest income. Any fund not able to do so is said to have "broken the buck" and is deemed as bankrupt and results in huge redemption pressures.

  A New York based fund - Reserve Primary Fund, a USD 62.6 billion MMMF broke the buck on 16 September 2008. The fund included $ 785 million of short term debt issued by Lehman and the value of it was reduced to zero after Lehman bankruptcy. The investors knew this investment and demanded huge redemptions from the fund. By Tuesday afternoon (16 September 2008), the fund size had declined to 23.6 billion. The Lehman investment and huge redemption led the fund to break the buck and declared its NAV at 97 cents. The fund has been closed and redemptions will be honored only after 7 days of application. Likewise another MMMF, Putnam Prime Money Market Fund has shut operations and is returning money to investors. The surprise is it has not broken the buck but has done so because of redemption pressures.

  All this led to concerns over the entire MMMF industry (which is estimated to be USD 3.4 trillion industry) and there were concerns that there would be a run on these funds. This led to another intervention from Fed and Treasury but it was fairly complicated. President George W. Bush approved made available as necessary the assets of the Exchange Stabilization Fund for up to $50 billion to guarantee the payment in MMMFs. The Fed statement said:

  > *Fed will extend non-recourse loans at the primary credit rate to U.S. depository institutions and bank holding companies to finance their purchases of high-quality asset-backed commercial paper (ABCP) from money market mutual funds. This should assist money funds that hold such paper in meeting demands for redemptions by investors and foster liquidity in the ABCP markets and broader money markets.*

  This is a fairly complex set of transactions. Meanwhile, reports indicate that concerns over MMMFs continue and most are undergoing huge redemption pressures.

- **SEC and FSA ban short-selling on financial stocks (19 September 2008):** The stock prices of financial firms have been under severe pressure in the wake of the crisis. The pressure tightened in September 2008 and this led to more downward pressures on the already battered stocks. The SEC and FSA suspended short-selling in stocks of financial companies for a temporary phase. SEC banned 799 stocks till 2 October 2008 and FSA has banned 29 stocks till 16 January 2009. This has been followed by bans/suspensions in other countries as well- Australia, Taiwan, Germany, France, Belgium, Japan, Hong Kong etc.

- **Treasury plans to take over distressed assets (21 September 2008):** Treasury pressed the grandest of all interventions. Treasury has proposed a plan to Congress under which it will buy USD 700 bn of distressed assets from the financial system. The plan will be operational for two years from the date of enactment. After two years, as markets stabilize, the assets would be liquidated and any additional returns will be returned to Treasury's general fund. The assets to be purchased are residential and commercial mortgage-related assets. Further, other types of assets might be added in consultation with the Federal Reserve. The price of assets will be established through market mechanisms where possible, such as reverse auctions. The statement further says:

  > *Funding for the program will be provided directly by Treasury from its general fund. Borrowing in support of this program will be subject to the debt limit, which will be increased by $700 billion accordingly. As with other Treasury borrowing, information on any borrowing related to this program will be publicly reported at the end of the following day in the Daily Treasury Statement. ..Within three months of the first asset purchases under the program, and semi-annually thereafter, Treasury will provide the appropriate Congressional committees with regular updates on the program.*

Treasury's General Fund is the main account of the US Government. The recent (19 sep 2008) account statement of the General Fund says the public debt limit is USD 10.6 trillion (actual debt stands at USD 9.6 trillion). So, if this is new USD 700 billion fund is passed the limit will increase to USD 11.3 trillion. The legislation is yet to be passed by the US Congress. Meanwhile US Senator Christopher Dodd from Connecticut released another variant of the plan to buy distressed assets from US financial system.

The plan saw a mixed fortune. On 28 September 2008, The House Committee on Financial Services released a skeletal draft of the plan. It was called as Emergency Economic Stabilization Act of 2008. The draft indicates that apart from the USD 700 billion relief, the US Congress is trying to ensure that the funds result in some benefits for taxpayers. It has imposed a penalty on firms that sells distressed assets and gives its executives are given a golden parachute. They are also setting up an overseer of this plan. However, the plan was rejected in the vote in the US House of Representatives on 29 September 2008. This led to a panic in financial markets and the financial markets collapsed worldwide. There were statements by US President Bush over the importance of the plan. The Bill was passed

- **Investment Bank giants converted to Commercial Banks (22 September 2008):** In another unprecedented move, Goldman Sachs and Morgan Stanley agreed to become Commercial Banks and come under Fed regulation and supervision. This was done to prevent these two banks from crumbling under market pressures.

- **Commercial Banks being merged:** JP Morgan acquired Washington Mutual Bank (WaMu) on 25 September 2008 and Citigroup acquired Wachovia on 29 September 2008. This made WaMu the biggest bank failure and along with Lehman which is the biggest company to go under bankruptcy, has led to a complete collapse of the financial system in US.

Some questions from the above developments

Overall, it has been a very eventful month. However there are a few questions which are to be answered.

1. **What will be the impact of Treasury plan?** The initiative is being compared to the Resolution Trust Corporation (RTC) floated in 1989 to help US economy recover from the losses of Savings and Loan Institutions. Infact there are few similarities. Between 1980 and 1994 several Savings and loan institutions failed (approx 1,300 with combined assets of more than $600 billion) In 1986, these failures had bankrupted the Federal Savings and Loan Insurance Corporation, the federal insurer for the thrift industry. After some intervention and resultant failures, the US government created RTC. RTC would buy the distressed assets and let financial markets function efficiently. The RTC was eventually folded with FDIC. We have a similar sequence of events now. Both Fed and Treasury have tried everything but nothing seemed to work. Hence, they have decided to take out a bigger plan hich takes care of the entire financial system

   There are some differences as well. Unlike RTC, which was enacted much later in the crisis (the crisis started in 1980), the new plan is being enacted within just one year of the crisis. This implies the authorities want to minimize losses right away and not wait any longer. A part of the reason is that this crisis is far more wide-spread and covers most kinds of financial activities- commercial banks, mutual funds insurance, I-banks etc.

   This new plan poses similar questions posed in times of RTC. The first question is how much will the total cost of the crisis be? What will be the cost on the taxpayer and consequently the rise in public debt? For this it will be useful to look at the experience of RTC. In a FDIC paper (The Cost of the Savings and Loan Crisis: Truth and Consequences by Timothy Curry and Lynn Shibut), the authors point that RTC bought 747 S&L institutions with total assets of $ 394 billion. RTC was funded by various US government bodies and total funds provided to RTC were USD 91.3 billion. The thrift crisis cost taxpayers approximately $124 billion and the thrift industry another $29 billion, for an estimated total loss of approximately $153 billion. The losses were higher than those predicted in the late 1980s, when the RTC was established, but below those forecasted during the early to mid-1990s, at the height of the crisis. So far, Treasury has indicated that it plans to buy assets worth USD 700 billion and this will be the rise in public debt as well. But as it has been seen in RTC's case the actual could be higher than the expected. Moreover, FDIC in its Q2 2008 report indicated that the number of institutions on the FDIC's "Problem List" increased from 90 to 117 during the quarter and Assets of "problem" institutions increased from $26.3 billion to $78.3 billion.

The second question is the valuation of the distressed assets. The problem is that financial firms are short of capital and need additional capital to remain solvent. If the value of assets is at a discount (which should actually be the case) then it does not help banks much. If it is at a premium, the Congress will object as it leads to higher public debt. Bernanke in his recent testimony (23 September 2008) said that Treasury should buy the assets "close to the hold-to-maturity price" as it will prevent fire sale of assets.

The third question is the type of assets that will be brought from the balance sheets. There is no clarity on the same and looking at the current developments, it seems virtually all assets would have to be included. This will worsen pose the valuation problem.

The fourth question arises because of certain interesting developments. WSJ reported (September 23, 2008) indicated that other industries are pressing for inclusion in the plan. Auto-finance companies are also facing a liquidity crunch and lobbyists are pressing to include them. Other businesses, such as student and credit-card lenders, also could eventually access the programme.

The fifth question is with respect to the restructuring of these various bailouts. It has been seen that both Treasury and Fed have been pretty innovative with the various bailout packages. They have dipped in some or the other fund and have arranged a myriad of transactions within each bailout. The impact on public finances is not yet known and this might worsen the already high US public debt.

2. **Will Europe (and others) follow as well?** A related question to first problem that is being discussed is - will this step force other economies to provide similar plans to their financial system as well? The financial market disruptions have been felt across most developed economies and similar interventions in their respective economies can't be ruled out. Both subsidiaries of US financial firms and home grown financial firms have faced liquidity pressures. Their Central Banks have also been as active as Fed providing liquidity support and expanding eligible collateral base. In an interesting post on voxeu.org (20 September 2008), EU based economists Daniel Gros and Stefano Micossi said the following:

> *Formal default of AIG would have exposed European banks' large gap of regulatory capital, with possibly devastating effects on their ratings and market confidence.*

The authors point Europe's banks have become not just too big to fail but too big to save as well.

> *For example, the total liabilities of Deutsche Bank (leverage ratio over 50!) amount to around 2,000 billion euro, (more than Fannie Mai) or over 80 % of the GDP of Germany. This is simply too much for the Bundesbank or even the German state to contemplate, given that the German budget is bound by the rules of the Stability pact and the German government cannot order (unlike the US Treasury) its central bank to issue more currency. The total liabilities of Barclays of around 1,300 billion pounds (leverage ratio over 60!) surpasses Britain's GDP. Fortis bank, which has been in the news recently, has a leverage ratio of "only" 33, but its liabilities are several times larger than the GDP of its home country (Belgium).*

This analysis was very correct with concerns spreading over European Markets. European governments on 29 September 2008 had to nationalize a few financial entities- Fortis NV, Dexia, Hypo Real Estate and Bradford & Bingley. Denmark's Central Bank had to take over Roskilde Bank, country's eighth largest bank.

Moreover, there are reported comments that the French President has also asked to introduce a plan on the lines of TARP and there are discussions over the plan. Interestingly, The Emergency Economic Stabilization Act of 2008 has already made a provision on this matter.

> *Section 112. Coordination With Foreign Authorities and Central Banks. Requires the Secretary to coordinate with foreign authorities and central banks to establish programs similar to TARP.*

Apart from Europe, wide concerns are being felt in other developed economies as well. New Zealand Central Bank has released four statements from August 21, 2008 assuring it is stable It has become quite common for Central Banks of various economies to make statements over the stability of their respective financial systems.

3. **How far would the Fed intervention go?** Fed intervention in the crisis has been exemplary. Chairman Bernanke has been a student of Great Depression and is the best person Fed could have in this situation. He has written numerous papers exploring the role of credit markets in an economy. His expertise has led to development of wide variety of tools (TAF, PDCF, TSLF etc; explained above) and ample liquidity intervention to support the falling markets.

   However, these operations have resulted in Fed itself needing liquidity and needed support of US Treasury (The media reported the development as Fed going Broke). The US Treasury in order to help Fed hasdecided to issue special T-bills:

   > *The Treasury Department announced today the initiation of a temporary Supplementary Financing Program at the request of the Federal Reserve. The program will consist of a series of Treasury bills, apart from Treasury's current borrowing program, which will provide cash for use in the Federal Reserve initiatives*

   There have been numeorus questions already over the quality of the assets Fed has absorbed from the system. James Hamilton in his blog (www.econbroswer.com) remarked:

   > *By my count, the Federal Reserve has already extended something on the order of $455 billion in loans collateralized by some of these same troubled assets, namely $125 billion in repos, $150 billion in the term auction facility, $50 billion in "other loans", $30 billion from the Bear Stearns deal, and $100 billion in "other Federal Reserve assets". That $455 billion total does not include this week's $85 billion loan to AIG, nor the $180 billion in reciprocal currency swap lines.*

   The same thoughts lead to questions over another area of research Bernanke has excelled in - inflation targeting mandate and Central Bank independence. Bernanke has been a leading votary of the need for Central Banks to have an inflation targeting mandate and should be independent from the government in its role. However, inflation has surged in US economy and despite noting upside risks in all its FOMC statements, Fed has preferred to focus on failing financial markets. Likwise, its coordination with Treasury over various initiatives and bailouts to so many firms not under Fed's supervisory mandate (I-banks, MMMF, Insurance firms etc) have raised questions over Fed independence from US government.

4. **How much is too big to fail?** How do we manage the moral hazard? All the above firms were provided support on the notion that they are too big to fail (TBTF). TBTF has always been a cause of concern for the policymakers in financial markets. The same problem is not felt in non-financial firms as there have been many episodes of firms collapse and bankruptcy. However, allowing collapses and bankruptcies are difficult for policymakers in financial markets. Traditionally, we had Bank runs where a collapse in one bank led depositors to queue outside another bank leading to collapse of other banks as well. In today's crisis the story is much similar with players changing. Now, concerns over a particular I-bank leads to a run from the various lenders who have lent monies in the money markets. So, the story of Too Big to Fail has shifted from a commercial bank to an investment bank and other firms (insurance, mutual funds etc)

   However, TBTF policy is a double edged sword. It may lower the current losses but can also raise the stakes of losses in future. The moment authorities recognize a particular firm as too big too fail, it leads to a moral hazard problem. For instance mechanisms to counter TBTF, like deposit insurance (where deposits of banks are insured) are often debated as they could lead to banks taking much higher risks. The Banks know that as the deposits are insured they can take higher risks and lead to a bigger moral hazard problem. Likewise the current crisis saw its seeds being sowed in the LTCM crisis in 1998. In LTCM crisis, most of the financial firms were in trouble as they were a counterparty to the various LTCM transactions and a collapse in LTCM would have led to a problem for the financial firms as well. However, Fed intervened and arranged a collective bail-out. So, Fed helped mitigate the crisis then but it led to a much bigger crisis in 2008.

In this crisis, we have seen TBTF being extended to smaller banks like Northern Bank, to investment banks, to money market mutual funds etc. So, how would the behavior be checked in future? How will authorities ensure the moral hazard problem does not get worse when we have seen it actually gets worse each time? Economists have said one cannot think about moral hazard in times of crisis, but that is exactly the time when one has to think about it. Only when the risks get bigger next time does the question of moral hazard arises.

5. **Can we still have a Bank Based regulation?** There is always a debate amidst economist over the two kinds of financial system- bank based and markets based. Banks based systems have banks at the center and banks are responsible for all the main functions of the system. Market based System on the other hand look at other market intermediaries (Mutual Funds, Investment banks etc) along with Banks to perform the functions. The economists say that both systems have their own advantages. However, as time passes the financial system would move from a bank based to a more market based system with different type of firms participating in the market. This has indeed been the case in most economies that started with a heavy bank based system to a lesser market based system.

   Now the moment we have a market-based system, the regulation also has to move in similar lines. The integration of financial markets not only linked banks with other banks but across the various market firms as well. However, restrictions and regulations only apply on the commercial banks with other firms either having lesser regulations or none at all. This thinking is most likely going to change. Fed had to look at its exigent clause to bail out the investment banks. Minneapolis Fed pointed this in its research note (The History of a Powerful Paragraph, June 2008):

   > *Section 13 paragraph 3 of the Act, which begins: "In unusual and exigent circumstances, the Board of Governors of the Federal Reserve System, by the affirmative vote of not less than five members, may …," and then there's a lot of technical language which essentially means that the Federal Reserve can lend money to "any individual, partnership, or corporation," as long as certain requirements are met.*

   Likewise, Fed had to device new monetary policy tools like PDCF, TSLF etc to help provide liquidity to firms other than commercial banks. Fed also converted Goldman Sachs and Morgan Stanley to commercial banks to provide a signal to the financial markets that they are now under Fed supervision and are likely to be safer. In a new paper presented at Kansas City Fed symposium 2008, Tobias Adrian and Hyun Song Shin showed broker-dealers respond more aggressively to Monetary Policy changes:

   > *In a market-based financial system, banking and capital market developments are inseparable. We document evidence that balance sheets of market-based financial intermediaries provide a window on the transmission of monetary policy through capital market conditions. Short-term interest rates are determinants of the cost of leverage and are found to be important in influencing the size of financial intermediary balance sheets. However, except for periods of crises, higher balance-sheet growth tends to be followed by lower interest rates, and slower balance-sheet growth is followed by higher interest rates. This suggests that consideration might be given to a monetary policy that anticipates the potential disorderly unwinding of leverage. In this sense, monetary policy and financial stability policies are closely linked.*

All these evidences point that financial regulation landscape is going to change with similar restrictions being applied to other kinds of financial firms as well. It will be very interesting to see the developments in the space of financial regulation.

6. **What exactly is financial innovation?** Before the crisis CDOs, CDS and other subprime mortgage products were hailed as hallmarks of financial innovation. It was widely believed that the various subprime mortgage products have enabled low income people buy their own homes; CDOs and CDS helped transfer risks from the baking system (originator) to the others who were willing to take the risk, thus diversifying the risks across the financial system.

However, in this crisis we have seen none of these statements were true and have been vindicated. The instruments that were supposed to minimize and diversify risks have been found to maximize and concentrate risks. IDBI Gilts Limited in its report on CDS markets (Credit default swaps- The next big crisis in making - 20 May 2008) had shown that these instruments were highly risky and were not really solving the purpose of managing credit risks. The various Fed interventions have so far prevented this markets from collapsing. Even in the recent events, the CDS spreads had widened considerably and would have collapsed if there were no interventions. ISDA had to issue protocols to settle the contracts in an amicable fashion.

Financial innovation as a concept needs to be reviewed. We should assess the success/failure of a new financial product only by assessing the utility of the product in the full business cycle. Dani Rodrik in his blog (22 September 2008) says:

> *What I would love to hear are some examples such financial innovation-not of any kind, but of the kind that has left a large enough footprint over some kind of economic outcomes we really care about. What are some of the ways in which financial innovation has made our lives measurably and unambiguously better?*
>
> *If I had asked this question a little over a year ago, I suppose I would have been hearing a lot about how collateralized debt obligations and structured finance have allowed millions of people to purchase homes that they would not have been able to afford otherwise. Sorry, but you will have to come up with some other examples now.*

7. **Is there any difference between policy responses of emerging and developed economies?** It is important to realize that this crisis has impacted the developed economies much more than developing economies. However, the policy responses and actions have been very similar to what policymakers in emerging markets have taken to alleviate crises in their economies. The irony is that the developed country counterparts have always criticized the policy responses of the emerging economies. For instance, the role of fiscal stimulus is always questioned; central banks should be focused on inflation and not on collapsing growth; financial markets should not be bailed out because of moral hazards etc. However, as we have seen in this crisis that developed economies policymakers have retorted to similar policy moves. Moreover, what has also been noted that certain ideas that were only applicable for developing economies are applicable to developed economies as well.

Let us take the case of Lender of last resort (LOLR) function of Central Banks. LOLR implies when liquidity in financial markets dries up, the central banks should offer liquidity to the financial system. The central banks should offer liquidity against good collateral to sound institutions. (Good collateral implied government bonds or perhaps AAA bonds but Fed is now accepting even investment grade bonds).

LOLR function was modified for emerging markets as they often have much of their debt denominated in foreign currency. An injection of liquidity in the form of domestic currency can raise inflation fears and cause domestic currency to depreciate. The depreciation further causes the domestic-currency value of the liabilities to rise, creating a severe economic contraction. Therefore, in an emerging-market economy, LOLR should be in the form of foreign, not domestic currency.

Liquidity provided by foreign sources can help emerging-market countries cope with financial crises without many of the undesirable consequences that can result from the provision of domestic-currency.

Conversely in this crisis, we have seen central banks of developed economies that have to provide liquidity (or do the lender of last resort) in foreign currency mainly in US dollar. The Central Banks of Euroarea, Switzerland, Canada, Japan, Australia, England, Norway Sweden etc have set up swap lines with Fed to provide liquidity in USD in the former's markets. Additionally, central banks of developed economies have expanded their accepted collateral basket to securities issued by US Treasury (Bills, bonds etc).

The authorities have underestimated the impact of financial globalisation for a fairly longtime. They have always believed that financial globalisation only has benefits. There have been enough events showing the interconnectedness of financial markets with stress in one country impacting other as well. Hence, LOLR in foreign currency is more applicable to countries that are more financially integrated as others.

8. **What will be the impact on Emerging markets?** The decoupling idea which gained momentum in wake of the crisis saying emerging markets would not be impacted, has been found vulnerable. IDBI Gilts Limited in its report (Decoupling or recoupling - 7 Jan, 2008) explained the two channels through which the crisis in US (or any other economy) impacts other economies. The first channel is trade flows and second is financial flows. There is not much clarity over the impact of trade flows but the impact of financial flows has been clearly seen in the crisis.

The crisis has impacted virtually every economy's financial markets. At first the impact in emerging markets' financial markets was felt on account of slowing down of capital inflows in the US economy. The second impact was felt when the large financial institutions started collapsing posing concerns over the health of their subsidiaries in the developing economies and there were questions over the health of the counterparties of these financial firms. The end result is sharp correction in the stock indices of other economies. The problem has been that fundamentals in the emerging markets have not changed much and the correction in stock indexes is a big question mark. This implies that either the stock prices were overpriced or stock prices have simply reacted irrationally. More research is needed to identify the sharp correction in stock prices.

As the crisis has deepened and near recession is expected in developed economies, the other channel - trade flows- is also likely to slowdown and impact the growth in the economies. So, the impact of sub-prime that was a small component of US financial markets has gone onto create a earthquake in world financial markets and economies. Further impact on emerging economies will clearly depend on how far the crisis will go.

Another issue with emerging markets is the reforms in financial markets. Most emerging markets are undergoing reforms in financial markets and there is a concern that this crisis will stall the reforms in these economies. This is not likely to be true as emerging economies have learnt the importance of having an efficient financial market. Hence, the effort to reform financial markets are likely to continue. However, the authorities should review the ongoing reforms and integrate it with the learnings from the crisis. For instance, the crisis has shown that along with banks, there is a need to focus on other financial intermediaries. So now the authorities need to understand the role of other financial intermediaries in their financial system. Similarly, the crisis has shown how asymmetric incentives can worsen the crisis. The role of incentives is not included in any reform agenda so far and needs to be assessed as well. Above all, the authorities should strive towards developing a financial system whose developments can be understood by all the stakeholders. The financial system has become too complicated and complex for even the best in the business to understand (Read IDBI Gilts report - Financial Education Programs - Is teaching ABC of Finance enough 2 July 2008).

Final thoughts

This crisis has been an eye-opener on many counts and has opened a can of worms for the policymakers. What is worse is that each worm seems to multiply itself and pose multiple problems for each policy action. The policymakers have tried to find scapegoats. Large part of the blame has been shifted to the Greenspan's ultra loose monetary policy in early 2000s. This has been quite a turnaround as the same person who was hailed as the greatest Central Banker ever has now become the worst villain. He was praised then for bailing out the US economy and helping achieve higher growth. The situation in US economy then was that of a deflation and there was little choice other than to have a loose monetary policy.

Moreover, if this arguement is true then the same Fed policies should be criticized now as well. In 2000s also in wake of the crisis, Fed eased its interest rates and infused liquidity in financial markets and we had a bubble in housing markets and a crisis now. So, the market participants should tell Fed not to intervene in financial markets and let markets correct themselves. But this is not the case as financial firms have been queuing outside regulators for more and more support. Going by this logic, in next crisis Bernanke and his policies will be blamed for the crisis.

The real problem has been the near collapse of business ethics in financial firms. In search of higher yield, all kinds of financial instruments were created and traded in the name of financial innovation. On looking at the balance-sheets of the financial firms, a common thing to note was the huge leverage positions of these firms. One did not need financial acumen to understand that in case of a problem, the possibility of these firms collapsing together was almost certain. As leveraging has happened together, so would be the case of deleveraging. What was only questionable was the timing of the collapse. If it was not via sub-prime crisis it would have impacted though some other market.

There will be a need to review all the existing practices of financial activity, right from compensation structures to regulation. The policymakers should not ignore these developments and strive to develop a more resilient financial system.

IDBI Gilts Limited (A wholly owned subsidiary of IDBI Ltd.)
1st Floor, Janmabhoomi Bhavan, Janmabhoomi Marg, Fort, Mumbai – 400 001.
Phone: (91-22) 6617 7900. Fax: (91-22) 66177999