

*Recent Financial Market Developments and Implications for Monetary Policy**

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I am honoured to be invited to deliver the valedictory address at the Asia Regional Economic Forum. The relationship between India and the Institute of International Finance (IIF) goes back a long way to the early 1990s. Therefore, it is only befitting that the IIF has chosen to inaugurate the Asia Regional Economic Forum in Mumbai as an opportunity for the informal exchange of ideas and views on the region and the global economy, with emphasis on key issues relating to India. I observe from the proceedings of the forum that there has been a timely focus on and comprehensive coverage of developments in global and regional financial and commodity markets, the financial system at large and issues relevant for emerging Asia.

Over the last two months, a good deal of our collective attention has been focused on the turmoil in financial markets in the United States and Europe and the sudden plunge in credit market confidence triggered by emerging risks to exposures to the US sub-prime mortgage crisis. Even as every passing day unravels a little more of the underlying forces at work – the complex nature of the derivatives used; the high degree of leveraging on poor, light or even absent collateral; the underestimation of risk pervading financial markets; the surprisingly sizeable exposures of large financial institutions to some of the debt instruments and derivatives in question; and the speed of contagion – I believe that we still have to travel much further before we understand the full impact of these recent events in terms of both information and analysis. Consequently, there is considerable uncertainty surrounding both debt and credit markets as of now. Quite

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justifiably, regulators, monetary authorities and finance ministries are all engaged in containing the risks posed by these developments. In my address, I thought I would take this opportunity to stand back from the actual play of events and try to gain an understanding of the nature of the turbulence, why it happened, where it happened, and the implications for central banks. In the rest of my address, I will reflect on some overarching forces that led up to and characterised the recent spate of events, the specific responses of central banks and some challenges that are likely to face them as the future unfolds.

II. What is Going On?

Perhaps the most defining feature of the global economy over the last three decades has been what has been termed as the 'Great Moderation' – the sustained decline in inflation and in inflation volatility. A comparison of the period since the Asian financial crisis *i.e.*, 1998-2007 and the 30 years preceding the crisis (1970-97) shows that in the recent period, inflation (CPI) in advanced economies has averaged 1.9 per cent, down from 5.8 per cent in the earlier period. Over the same period, inflation in developing economies declined from 31.0 per cent to 7.0 per cent. Over the same time span, inflation volatility measured in terms of coefficient of variation has fallen from 0.55 to 0.20 in advanced economies and from 0.54 to 0.32 in developing economies. Consequently, average nominal interest rates (LIBOR rates on the US dollar) have also moderated from 8.3 per cent in the previous period to 3.8 per cent in the recent period. This feature has also been reflected in some decline in real interest rates as well,

from 2.5 per cent to 1.9 per cent. The secular lowering of nominal and real interest rates across the world has enhanced the appetite for risk even as pricing of risk has become increasingly difficult.

The second important feature of recent global developments which could have had a direct bearing on the current crisis is the role of monetary policy. Since the technology stocks meltdown in 2000, there has been significant monetary accommodation by the major economies – the US, Euro area and Japan – and it is estimated that between one-half and two-thirds of US currency supply is held outside the US. Growth in monetary aggregates has been higher than the rates of growth that would have been expected *hitherto* in relation to real economic growth. Yet inflation has been contained at low levels. There is evidence of abundant excess liquidity in financial markets which is also reflected in the macro imbalances between the US and Asia. Consequently, there have been sizeable currency misalignments and carry trades, compression of risk spreads, mis-pricing of widely diffused risks and even real sector implications for several emerging economies. The strong macroeconomic performance of Asia has also contributed to the relentless search for yields and the increasing appetite for risk. In fact, in the annual economic symposium on 'Housing, Housing Finance and Monetary Policy' held by the Federal Reserve of Kansas City at Jackson Hole during August 30-September 1, 2007, Professor John Taylor (of Taylor rule fame) argued that the Fed had followed an excessively loose monetary policy between 2002-2006.

The combination of sustained low inflation accompanied by accommodative monetary policy worldwide could have generated excessive confidence in the ability of central banks and monetary policy to keep inflation rates and interest rates low indefinitely, leading to under pricing of risk and hence excessive risk taking. This result is analogous to the excessive foreign borrowing undertaken by private sector borrowers and banks in East Asian countries when exchange rates were seen as relatively fixed, and hence their risk perceptions were low. It may be ironic that the perceived success of central banks and increased credibility of monetary policy, giving rise to enhanced expectations with regard to stability in both inflation and interest rates, could have led to the mispricing of risk and hence enhanced risk taking. Yet another view is that more than success or failure of central banks, the repeated assurances of stability and guidance to markets about the future path of interest rates, coupled with the availability of ample liquidity was an invitation to markets to underprice risks. This view, consequently, puts the blame on those central banks who failed to give space to markets to assess risks by eschewing surprise elements in policy. It is possible that with increased globalisation resulting in the containment of prices of tradable goods during this period and hence of measured inflation, the excess liquidity has shown up in elevated asset prices worldwide, along with increased cross border capital flows in search of yields. Easy monetary policy itself may have generated a search for yields that resulted in a dilution of standards in assessing credit risk. The desirability of using monetary policy tools, and judgements regarding the adequacy of such tools, to meet

asset price movements is yet another relevant factor in this regard, in so far as most central banks did not address this issue. As some withdrawal of monetary accommodation commenced in response to perceived or visible inflationary pressures, the sub-prime crisis revealed these vulnerabilities starkly as confidence plunged, markets froze and triggered off panic among investors and lenders regarding their inability to value complex risky assets and structured derivative products. With the deterioration in credit confidence, banks have been forced to advance loans to their off-balance sheet "special investment vehicles (SIVs)" which uses up their capital thereby rendering other borrowers credit constrained (Roubini 2007¹).

Thus, it can be argued that it is the combination of low real and nominal interest rates brought about by the lowering of inflation, accompanied by the abundance of liquidity induced by accommodative monetary policy which lies at the roots of the current crisis. In this sense, the sub-prime is a symptom rather than a cause. Arguably, the outcome could have been quite different if, for instance, interest rates declined on the back of ebbing inflation but there was no accommodation in monetary policy and therefore no excess liquidity.

Whereas this view has been put forward by many commentators and analysts, there is also a persuasive opposite view, as best articulated by Alan Greenspan in a recent interview on the occasion of the release of his book (Financial Times,

¹ Roubini, Nouriel (2007), "The Risk of a US Hard Landing and Implications for the Global Economy and Financial Markets". Seminar at the IMF (available at www.imf.org).

September 17, 2007). He argues that the great moderation in inflation could be attributed to real economy phenomenon in addition to any monetary policy measures. First, the long run of productivity growth that has been observed in the US in the late 1990s and till recently in this decade has clearly been an important factor dampening inflation. Second, globalisation and the addition of a billion new workers in China and India have dampened wage growth worldwide and hence inflation. Whereas he agrees that the fall in long term rates provided the initial gain in house prices, he does not accept that these low long term interest rates can be attributed to the extended US Fed policy of low policy interest rates. As evidence, he points to the absence of any effect on long term interest rates when short term policy interest rates were indeed raised. So the jury is out on the extent of monetary policy effects on extended long term interest rates and hence elevated housing prices. As an aside, it will be interesting to explore as to whether the low interest rate regime was fully justified. Critics argue that the Fed should have tried harder, raising rates sooner and faster. In his response, Mr. Greenspan is quoted in the Financial Times (September 17, 2007) as saying that such a policy response would not have been acceptable "to the political establishment" given the very low rate of inflation and "the presumption that we were fully independent and have full discretion was false".

One issue that confronts us is why has the turmoil originated in the credit market and then spread to money markets and debt markets with such great rapidity. It is widely understood that the credit market

is characterised by information asymmetry. Borrowers have much greater information on their own credit quality than do the lenders and it is this asymmetry that has traditionally meant that the creditor has to have an enduring relationship with the borrower so that his or her credit quality can be monitored on a continuous basis. Banks therefore have traditionally had to invest considerable resources in performing this function. They have had the incentive to do so since they had borne the credit risk on their books. However, in many countries, from being originators of loans and bearers of risk, banks have become mere originators of loans and distributors of risk, because the traditional view of the role of banks has changed considerably in recent years. First, the availability of information technology has reduced the cost of information collection and maintenance considerably. Thus, a widespread belief has arisen that information on credit quality of small borrowers who may be widely dispersed across jurisdictions can be made impersonal, packaged, processed, and sold. Second, with the availability of such technology, and the belief that such information was available on a structured basis, a great deal of financial innovation could take place which essentially enabled the investor or risk taker to become progressively remote from the ultimate borrowers where the actual risks lay. A whole host of intermediaries in the form of mortgage brokers, mortgage companies, societies and the like were then able to package their mortgage assets including non conforming loans and sell down to different categories of investors, including Special Investment Vehicles (SIVs), hedge funds and

the like, most of whom were not regulated. The guiding principle behind this activity was that it is feasible for credit rating agencies to have enough information on a continuous basis to rate the instruments that had been packaged. It can certainly be argued that this is not a new development since mortgage backed securities (MBS) and asset backed securities (ABS) have been with us for some time and have been successful in providing liquidity to credit markets on a continuous basis without any accidents. The difference perhaps is that MBS packaged by the government sponsored entities (GSEs) were subject to certain relatively well enforced norms that presumably reduced the potential risk embedded in these instruments.

These considerations lead to the third set of issues that relate to the role of effective financial regulation and supervision. Has the recent crisis underscored the need for strengthening of oversight of advanced financial markets? Traditionally, financial surveillance has placed relatively more emphasis on banking regulation. Banks are highly leveraged financial entities who are also effective trustees of public money by virtue of holding deposits. Hence, they have to be effectively regulated and supervised in order to maintain public confidence in the banking system and depositors have to be protected from excessive risk-taking by banks. On the other hand, investors in hedge funds are high net worth individuals who do not need such protection. They are informed investors who are able to exploit the information efficiency of markets and, therefore, should be able to understand the risks implied by information asymmetry.

The current crisis was, however, triggered by the difficulties encountered by these investors who had taken large exposures to sub-prime related investments without having accounted for the potential risks embedded in these instruments. There have been a host of ills underlying these transactions, which are now coming to light. We need, however, to abstract from the details of all the malpractices that have led to the current situation and reflect on the incentive structure that led to these malpractices. In the event, even bank depositors have got exposed and as soon as information asymmetries became evident and credit ratings came to be regarded as inadequate, markets got frozen resulting in illiquidity for banks and erosion in depositor confidence with its consequential impact on financial markets, and monetary policy. The links between banks and non bank financial intermediaries, and other off balance sheet exposures were not adequately recognised or recorded by banking supervisors.

In the context of recent events, it is important to recognise that there is a need to understand better the process of transmission of risk information through various segments of the financial markets in order to address the crisis of collateral in the credit market. How much of the specialised information that rests with lenders can be systematised, packaged and transmitted to markets as credit ratings. The principle underlying securitisation is based on the lender having this specialised information which can be unbundled and sold in the market separately in tradable sizes. A large part of the market for structured finance products is over the counter. Can these

products be further standardised so that they can be traded on an exchange which enables greater transparency from the point of view of the investor? Are there better ways of generating more objective information on the market value of collaterals, especially in situations where collaterals are not fully marked to market since such information may not be available on ongoing basis? Are there limits to marking to market certain kinds of assets whose values are not available on a high frequency basis?

Changes in housing prices are dependent on a whole vector of factors, ranging from changes in local zoning and land laws, demand and supply balances in local areas, to changes in monetary policy. It is difficult to devise land price or housing price systems that are high frequency enough to transmit quickly through credit ratings and the like. However, improvements could be envisaged in terms of reforms in the land pricing systems, improvements in the functioning of laws and procedures for foreclosure, bankruptcy and rehabilitation. Efficient functioning of such processes and functioning of legal systems is essential if collateral is to have a marketable value that is observable and hence susceptible to systemisation in terms of information that can then become transparent. When the presumed value behind collateral is not either observable or realisable, securitisation markets break down. And this is what seems to have happened in financial markets today.

The lesson of the current financial market crisis goes both ways. On the one hand, market innovation has indeed helped in bringing financial markets closer to those

who need credit and did not have access to it earlier. Despite all the problems associated with sub-prime borrowers, it must be recognised that almost 10 million borrowers benefited from this market and were enabled access to housing finance, which had not been deemed possible earlier. With about 20 per cent of these borrowers reported to be delinquent, and in difficulty, it still means that about 8 million people clearly benefited from this market. On the other hand, the difficulties encountered draw attention to the kind of issues that can arise when the speed of innovation and incentive structures are flawed such that malpractices occur, and intrinsic difficulties arise in capturing and commoditising information that is perhaps not yet susceptible to such commoditisation.

From our point of view, we need to recognise the positive contributions that financial innovations make to enhance the efficiency of financial intermediation. At the same time, the Reserve Bank considers, in a dynamic setting, appropriate safeguards to ensure stability, taking account of the prevailing governance standards, risk management systems and incentive frameworks in the foreign, public, private and cooperative banks as also related non-banks. Overall, these progressive but cautious policies have contributed to both efficiency and stability of the financial system and enable current growth momentum in an environment of macro stability.

III. Response of the Monetary Authorities

A key question that has emerged from the current developments in financial

markets relates to the role of monetary authorities in the context of such a crisis. This issue is of concern to all of us in central banking. Over the last decade or two, it would appear that the focus of central banks has been narrowing relative to the more complex responsibilities that they have traditionally shouldered. A great deal has been written on this issue, a great deal has changed in terms of practices and, in some countries, the regulatory structure itself has been altered to move central banks to being relatively pure monetary authorities. According to this view, central banks should focus largely on keeping inflation low and stable, and in doing this also contribute to financial stability. To quote Harvard economist Kenneth Rogoff: "Indeed many economists believe that central bankers could perfectly well be replaced with a computer programmed to implement a simple rule that adjusts interest rates in response to output and inflation. But while [this] view is theoretically rigorous, reality is not" (Businessworld, September 17, 2007). Although some central banks, such as the US Federal Reserve, have an explicit mandate to also promote growth, a good deal of thinking in recent times tends to argue that inflation control by itself would promote growth and that central banks would be better off to concentrate on this objective alone.

It is instructive to examine what central banks have done in the current context. The responses of the central banks to the recent events in financial markets have shown that concerns for financial stability can assume overriding importance, irrespective of the legislative mandate handed down to central banks as part of

ongoing reforms. This is evident in the fact that central banks initially reacted by the injection of liquidity, including through special facilities and the expansion of eligible securities for collateral, rather than through interest rate cuts. Discussions involving central bankers in various fora indicate their willingness to consider other courses of action in favour of protecting growth. As we all know, the US Federal Reserve has gone further this week in cutting interest rates to promote both growth and in the interest of financial stability. And the U.K. authorities have had to provide liquidity to a specific institution, while giving a blanket guarantee to depositors on the safety of their deposits. Accordingly, it is becoming evident that central banks do have a role beyond inflation targeting. Evidently, both growth and financial stability matter for central banks.

When it comes to the crunch, in their roles as lenders of last resort (LOLR), and in discharging their responsibilities as the guardians of financial stability, they do need to perform functions that are more complex. Should central banks be lenders of last resort to the system as a whole by injecting systemic liquidity through open market operations only, or should they also provide liquidity to individual financial institutions that are judged to be solvent but illiquid? How do they arrive at such judgments if they do not have adequate information on individual institutions? Can they have such detailed information without ongoing responsibilities for regulation and supervision? This issue is not dissimilar, in terms of the existence of asymmetric information to that of the

problem of adequate transparency of information related to the value of collateral underlying asset backed securities.

Banks and financial institutions are typically highly leveraged institutions: thus judgements related to their solvency depend on the valuation of their assets at the time when difficulties arise. In the current case, banks have invested through a chain of vehicles in securities whose values are in doubt. When providing LOLR liquidity support, how is the central bank to make a judgement on the solvency of institutions to whom it is providing liquidity? As a greater recognition and appreciation of the appropriate role of central banks gains ground, it is possible that this will result in further rethinking on the functioning of central banks. A case in point is the separation of financial regulation and supervision from monetary policy which could have resulted in ineffective and inadequate surveillance in the context of the current crisis. There is a view that problems of information asymmetry might have got further aggravated with banks reporting both to the monetary authority and the regulatory body in charge of banking supervision.

In reviewing the evolution of central banks, one is struck by the constant evolutionary change that they have undergone over time, and the differences in their functions across different countries. Their functions have changed almost continuously in response to evolving circumstances. In fact, it is the occurrence of financial instability that led to the formation of some central banks, most notably, the founding of the US Federal Reserve after the 1907 financial crisis in the

United States. Thus, it will be interesting to see how thinking evolves as a result of the current crisis. Reams are already being written in the thoughtful financial press and much more is to come.

We had begun to forget the danger of contagion and the speed with which it takes place when it does occur. The current developments which began in a relatively minor segment of the financial market, viz., the sub-prime mortgage segment, have spread far and wide across continents. Similarly, problems arising in one financial institution have led to the suspicion of similar problems in other institutions leading to conditions similar to bank runs. The smooth running of banks, financial institutions and financial markets depends crucially on trust and credibility along with the availability of transparent information. Hence the legitimate role of central banks in maintaining financial stability can inevitably lead to unconventional actions that do indeed restore financial stability when there is a probability of the opposite taking place. What is most instructive in the current crisis is that small problems or problems in small institutions can cause financial instability through contagion. In this context, things do not appear to have changed much for a century. The 1907 financial panic that also travelled across continents started with difficulties in a relatively small New York financial institution, the Knickerbocker Trust Company!² Systemic risks do not necessarily originate in institutions judged to be too big to fail.

² Bruner, Robert F. and Sean D. Carr (2007), "The Panic of 1907: Lessons Learned from the Market's Perfect Storm", John Wiley & Sons, New Jersey.

IV. Assessment of the Future

At the current juncture, the likely evolution of the current financial market turmoil and its implications for the future has evoked mixed assessments. On one plane, the spread of contagion is drawing considerable concern, first, in view of the level of leverage; and second, on account of the nature of the vehicles that have created the leverage. On another plane, there is a view that turbulence would be restricted to the credit market and its impact on consumer spending and overall economic growth may be muted as credit worthiness would remain intact if, for instance, leveraged mortgage backed securities are held to maturity and not sold in distress.

First, according to the IMF's assessment, the systemic consequences of the turmoil are likely to be manageable with the fundamentals supporting strong global growth. The repricing of credit risks that is underway is a healthy correction and should not lead to a more serious market crash. The IMF expects that the reestablishment of credit discipline due to the recent prompt action by a number of central banks should help to ensure that the adjustment process occurs in an orderly manner. Long term investors tend to support this view. The ongoing flight to quality (US Treasuries) and into global equity funds suggests a continuing faith in strong fundamentals of the global economy.

Second, recent developments carry implications in the form of heightened market discipline and a stricter regulation of financial markets. Investors who relied on credit ratings of Collateralised Debt Obligations (CDOs) and Collateralised Loan

Obligations (CLOs) are likely to question the value of ratings in other markets. Moreover, leveraged buy-out activity is likely to wind down. While this could cause worries about equity valuations, it is expected that such concerns would eventually recede so long as corporate profitability remains strong. Furthermore, it is argued that carry trade, which has been a source of financial flows, may moderate and may even go through an abrupt unwinding and this would help in maintaining global financial stability.

In this vein, it is also argued that the recent developments will have a positive impact on the outlook for EMEs as a consequence of the diversification of portfolios of international investors and would further incentivise the maintenance of good macroeconomic policies in these countries. At the current juncture, it is expected that the fall out from the US sub prime crisis is likely to be limited for Asian banks and can easily be accommodated within their current rating positions. According to Moody's, exposures of Asian banks have book values that do not exceed 10-35 per cent of annual pre-tax pre-provision profits. The mortgage backed securities and CDO tranches held by these banks are usually senior and therefore losses, if at all, would be substantially below 100 per cent. The bulk of foreign currency investments by Asian banks (barring those in Japan, China, Korea and Singapore) continue to be in highly rated government and corporate bonds. Policy makers need to work with rather than against the grain of markets by continuing to enable financial innovations. They should, however, be vigilant for any signs of disorderly global rebalancing. Looking ahead, entrenching

financial stability into the future would depend upon bolstering market confidence.

In the overall assessment, the adverse consequences of the US sub prime turmoil could weigh heavily on the future stability of financial markets and have the potential to have a wider impact on global growth with particular concerns centred on the prospects for EMEs. If credit conditions tighten, EMEs could become particularly vulnerable to reversals of capital flows with serious implications for their future prospects. A slowing down of the US economy, in combination with capital reversals, could also have adverse consequences for growth on a prolonged basis by affecting exports of manufactures and services, depending on the extent of linkage with the US economy. On the other hand, the flight of capital to safety through diversification could even enhance capital flows to these countries. This could further complicate the conduct of monetary policy. We will have to wait and watch. In general, recent financial markets developments are indicative of evolving uncertainties for EMEs with significant challenges for the conduct of monetary policy and for ensuring financial stability in their economies. As central bankers, we will have to enhance our vigilance.

V. Challenges for Monetary Policy

Recent financial developments have drawn attention to the trying challenges facing central banks in the conduct of monetary policy, in particular, the limitations imposed by financial markets. These developments highlight the dynamic and complex links between central banks

and financial markets. While the dynamics of financial markets are being driven by a combination of a global search for yields, complacency about risks, financial innovations and unprecedented liquidity, the spread of more independent, rule-based central banks has facilitated risk taking through perception of a low probability of short term management or 'intervention risk'. This is set against the background of a shift in the balance of economic power within the global system, in particular, in favour of emerging Asia.

While taking a view on the debate, it is important to recognise the changes in the landscape of financial markets - transformation in structure, process and products of financial markets, consolidation in banking, increased electronic data flow and dramatic rise in volumes and volatility. The key issue for central banks is to differentiate between providing short term liquidity and operating medium term monetary policy and communicate the difference credibly.

The conduct of monetary policy is also complicated by a host of factors which seem to be simultaneously at work: risk of sustained contagion; global capacity constraints; rising food prices; record high international crude oil prices; tensions in inflation expectations; evolution of sovereign pools of foreign exchange reserves; extent of effectiveness of monetary policy; surveillance and risk monitoring systems; and downgrade risks. In this evolving scenario, central banks may find it necessary to blend the traditional setting of monetary policy with some rethinking and non-traditional policy options which could include coordinated

interventions, assurances of liquidity, backed by timely and credible action; emergency liquidity plans, business continuity plans and disaster management strategies. Admittedly, heightened uncertainties continue, even after taking into account the recent central bank activities in key jurisdictions. It is not even clear whether all the related issues have come to the surface for us to make meaningful assessment.

I expect that I can't conclude this address without saying a few words on the domestic situation in India. The best way of doing this is to quote the Governor from his recent speech in Mexico City.

"Available information indicates continuation of the growth momentum during 2007-08 so far at a strong pace with the impulses of growth getting more broad-based. Steady increases in the rate of gross domestic saving and investment, consumption demand, addition of new capacity as well as more intensive and efficient utilisation/capitalisation of existing capacity are expected to provide support to growth during 2007-08. The recent gains in bringing down inflation and in stabilising inflation expectations should

support the current expansionary phase of growth cycle. It is, however, necessary to continuously assess the risks to the inflation outlook emanating from high and volatile international crude prices, the continuing firmness in key food prices and uncertainties surrounding the evolution of demand-supply gaps globally, as well as in India. Risks from global developments continue to persist, especially in the form of inflationary pressures, re-pricing of risks by financial markets and danger of downturn in some asset classes. Excessive leveraging has enhanced the vulnerability of the global financial system. Large changes in liquidity conditions are obscuring assessment of risks, with attendant uncertainty. Given the flux associated with both financial markets and monetary policy settings globally, India cannot be immune to these developments. The policy challenge for Reserve Bank, now, is to manage the current transition to a higher growth path while containing inflationary pressures and focusing on financial stability. Contextually, we in the Reserve Bank are, therefore, maintaining enhanced vigilance to be able to respond appropriately to the prevailing heightened uncertainties in global financial, as well as, monetary conditions".