you to keep on learning, understanding yourself and your environment, so that you always stay ahead of the curve as far as success in various life roles is concerned.

18. The emerging challenges in the banking and finance sector call for a new, more dynamic, aggressive and challenging work culture to meet the demands of customer relationships, product differentiation, brand values, reputation, corporate governance and regulatory prescriptions. Understanding and dealing with difficult transitions would be the key for youngsters like you while designing strategies for the organizations that you will be eventually joining. While leadership skills, the ability to multi-task and manage competing imperatives will be the necessary ingredients of the new generation managers, the old-fashioned qualities of desire to learn, a strong sense of professional ethics, an enquiring mind, a strategic view, the qualities of humility and empathy, a willingness to embrace practical experience, and an eagerness to adapt to new experiences would continue to be critical. I am personally convinced that the women folk enjoy a head start when it comes to being able to multi task and manage competing imperatives.

19. Dr. Charles Eliot, the eminent educator at the Harvard University, was often asked, 'How had Harvard gained its reputation as the greatest storehouse of knowledge?' His reply used to be 'it is because the freshmen bring in so much of it and the seniors take away so little of it'. The witty professor had, of course, said it in a lighter vein. I am sure all of you have made the most of what your college offered you and are taking away a rich treasure-trove of learnings from here. The inputs that you have gleaned as part of your studies here would surely give you the foresight to see things before the curve, much before others do.

20. Before I conclude, there are three basic messages that I always like to convey when I get to interact with students. All of you have completed your student life and would be entering into professional lives shortly. With the academic credentials that you have attained at this institution, I am sure all of you will be able to build up successful careers. My first message to all of you is to never be complacent in life, because complacency is a short cut to failure. Plan wisely during your good times so that you have enough resources to live through the bad times. My second message is that though bad times are inevitable, they are definitely not permanent. So, don't be discouraged and disheartened. Stay positive and keep on working hard and the good times will return. My third message for success in life and in your professional careers is to be information literate. Retain the curiosity to seek and assimilate knowledge and to use this knowledge for taking decisions in an unbiased manner. This will help in ensuring that the decisions you take are in your best interests and in the interest of the organizations you work for.

Conclusion

21. We live in exciting times and as you stand on the threshold of a new life – I trust you will continue to cherish the ideals and dreams of youth, after all, they are what make life worthwhile. While you must rejoice and celebrate your achievements, you must also realise the enormity of responsibility that would now be cast upon you. The knowledge and skills that you have acquired here and the values you have imbibed,

must be utilised in not only carving a niche for yourself in the professional field that you choose but also in making a difference within your homes, your society and the country. You must work with a commitment towards upholding the values that your teachers and your Alma Mater has imbued within you. This would, perhaps, be the perfect '*gurudakshina*' to your teachers and to the institution.

22. I wish all of you every success in all your future endeavours.

Thank you.

*Approach to Regulation and Supervision in the Post Crisis World**

Anand Sinha

Ms. Usha Thorat, Director, Centre for Advanced Financial Research and Learning (CAFRAL), Mr. Aristobulo de Juan, a veteran supervisor and an international consultant, Mr. Pierre Yves Thoraval, former Deputy Secretary General of the French Banking Commission, Mr. Chris Cardoza, Program Director at the Toronto Centre, Ms. Shyamala Gopinath, former Deputy Governor, Reserve Bank of India and all the esteemed delegates of the conference. It is my privilege to address you all in this conference today.

2. The Conference is quite aptly themed '*Supervisory Effectiveness in the Post Crisis World*'. The policy makers and supervisors are trying to grapple with the havoc the crisis has wreaked. So much ink has been spilt and so many reams of papers have been used in describing the what, why and how of the crisis. New regulations have replaced old ones and new theories have come to the forefront debunking the old and crisis-battered beliefs. But one question still remains. Have we really come out of the crisis and entered the *post-crisis* world? Is the crisis now a thing of the past and is it firmly behind us? It does not appear to be so. If one looks at the latest IMF update on World Economic Outlook (WEO- Jan 2013), the growth rates have been revised downwards, though marginally, to 3.5 per cent for 2013 and 4.1 per cent for 2014 and it specifically notes that the Euro area continues to pose a large downside risk to the world economy.

3. If we look at the history of financial crises, they have never been far away. The earliest recorded crisis dates back to 13th century when there was a default by England. We have had so many crises in the more recent past such as, Great Depression of 1929, stock market crash of 1987, Asian crisis of 1997, banking crises in several countries in 80s and 90s and the dot com bubble of 2000, *etc.*, the latest being the global financial crisis of 2007 and the very recent and continuing sovereign debt crisis. However, all these crises (other than the global financial crisis) have been of smaller magnitude in comparison to the great depression of 1929. The global financial crisis of 2007, certainly, is of a very large magnitude and has had a devastating impact on the global economy. As it is said of peace that it is an interlude between two wars, perhaps, looking at the regularity of crises in the recent times, one would say, a calm period is an interlude between two crises. Such has been the history of financial crises in the past.

How was the global financial crisis different?

4. If the financial history is checkered with crises, then why is it that the current global financial crisis has assumed such a gigantic proportion in terms of coverage and impact? The very famous book '*This time is Different- Eight centuries of financial folly*', suggests that all crises have, more or less, similar origins and only that we do not take cognizance of them. However, looking at the significantly large and unparalleled dimension of the current crisis, one will have to assume that there must have been other serious contributory factors. In fact, if you recollect, the crisis originated in a small segment of the US financial system- the subprime market – and many were generally sanguine and had even dismissed the crisis initially as a small and localised one which did not

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have enough potential to spread to, and impact other segments. However, the crisis soon exploded into a major crisis impacting not just the US financial system but the entire globe. Therefore, one could surely agree that there were very many fundamental weaknesses in the system which exacerbated the crisis.

5. Let me give you some details regarding the magnitude of the crisis. I am quoting from Andrew Sheng's book '*From Asian to Global Financial Crisis*' where he refers to a text message which made rounds in December 2008. *"1 year ago RBS paid USD 100 billion for ABN AMRO. Today that same amount would buy: Citibank USD 22.5 billion, Morgan Stanley USD 10.5 billion, Goldman Sachs USD 21 billion, Merrill Lynch USD 12.3 billion, Deutsche Bank USD 13 billion, Barclays USD 12.7 billion, and still have USD 8 billion change … with which you would be able to pick up GM, Ford, Chrysler and the Honda F1 Team".* This was the dimension of the crisis which shows how the valuation of banks and financial institutions plunged at the height of the crisis.

6. Economies go through business cycles, *i.e.*, upturns and downturns, or booms and recessions, and come out rather quickly but when they are hit with financial crises, they take longer to come out. History suggests that recessions following financial crises are bigger than normal recessions with output losses being 2-3 times larger and recovery from recession following financial crises being slower, as we are witnessing now. The core reason for this is the leverage that gets built up in the run-up to the crisis which acts as a drag on the economy and slows down the recovery. It is for this reason that, despite massive quantitative easing by central banks and fiscal stimuli by sovereigns, the global economy is yet to recover significantly from the global crisis.

7. The crisis has impacted the world in a major way, both financially and non-financially. While the financial impact is recorded in terms of huge output losses, increase in unemployment and erosion in wealth, the non-financial impact is no less. Crisis has shaken the very roots of long held beliefs and convictions. Just when we thought we knew all the answers, the crisis posed new questions forcing us to find out new answers. That reminds me of physics, in which I graduated and which remains my favourite subject. During the turn of the last century, physicists came to the conclusion that they had found out all that they needed to know about the laws of nature. All that remained was to apply these rules to find out answers to some of the questions. Then there were two major experiments which changed the entire scenario resulting in the development of radically different theories to explain the phenomena. Similar things have happened in the financial world – may not be of similar magnitude – that have shaken the intellectual foundations and left us groping for answers to new questions. There has been a paradigm shift in the thinking on regulatory philosophy and approach, especially in areas of systemic risk and efficient market hypothesis; on several aspects of macroeconomic thought, for example, role of monetary policy in ensuring financial stability, incorporation of banking and financial system dynamics in macroeconomic models and realising that macroeconomic stability is a necessary but not a sufficient condition for ensuring financial stability.

8. A lot of work was initiated in the aftermath of the crisis to address risks that were identified to have caused or exacerbated the crisis. The approach to regulation and supervision has changed in a significant way drawing lessons from the crisis. Before I expound on the revamped approach to regulation and supervision in the post crisis world, let me step back a little and briefly touch upon the genesis of crisis. This not only helps in putting things in perspective, but as we deliberate on the reasons underlying the crisis, the solutions would automatically flow.

The genesis

9. Several factors were responsible for the crisis. However, at the core of the crisis was the inadequate understanding and measurement of risks and funding of assets with shorter term liabilities on a large scale. There was aggressive easing of monetary policy in the US after the bursting of dotcom bubble leading to very low interest rates. The long term yields in the US were also depressed on the back of global imbalances as the huge reserves built by countries, specifically China, found their way back to the US treasuries. An era of Great Moderation followed: there was steady growth in advanced economies and accelerated growth in emerging market economies along with low and stable inflation. This resulted in policy makers believing that they had found the holy grail of high growth with low inflation. Underlying this belief was the notion that markets had become mature and sophisticated and had the wherewithal to distribute risks and provide efficient hedging instruments to those who needed. Low interest rates triggered a massive search for yield which led to financial innovation that was socially suboptimal. The innovation was aided by the progress in quantitative finance and modelling and technological developments. While we cannot disregard the utility of financial models – they are certainly very useful – overreliance on such models proved to be disastrous. The financial models, in contrast with the models used in physics, are not governed by immutable laws of nature but by the human behaviour – the herd mentality, irrational exuberance and pessimism, greed and fear, which cannot be modelled with any accuracy. Hence, these limitations need to be factored in while using the models.

10. Low interest rates prior to the crisis enabled build up of leverage. In fact, if we observe closely, leverage happens to be the major contributing factor to most crises. Let me explain in brief. When times are good, there is a feel good factor, there is plenty of liquidity which is cheap, the asset values and collateral values are high and the banking system losses are low, leading to lower provisioning and lower capital requirements. These factors lead to higher demand for credit from the households and corporates. From banks' perspective, as the provisioning and capital requirements are lower, they have surplus capital and raising of capital is also easy. This leads to a greater incentive to lend and expand the balance sheet. Therefore, the increased credit demand from the borrowers and the increased incentive to banks to lend, results in the build up of leverage. When the cycle turns, pessimism sets in, losses increase, value of assets and collaterals diminish and liquidity dries up and becomes costlier. These erode the financial health of banks, households and corporates who become risk averse. The demand for credit by households and corporates as also the supply of credit by banks slows down. Banks also deleverage to preserve their capital. All these exacerbate the downturn. Leverage is an amplifier in as much as it amplifies the profits during upturn and exacerbates losses during the downturn: higher the leverage, more severe is the downturn. This amplification is also called procyclicality. Prior to the crisis, the regulatory policies did not effectively address the systemic risks arising out of procyclicality and interconnectedness.

11. Lack of appreciation for systemic risks and the absence of suitable regulatory framework to address such risks was one of the major reasons for exacerbation of the crisis. The thinking prevailing prior to the crisis was that strong individual institutions make a strong system, which did not turn out to be true. The crisis brought home the fact that even when the institutions are individually strong, when each one of them tries to pursue and preserve their own self interest, their actions could lead to instability of the system.

12. The credit risk transfer mechanism was also highly flawed. Securitisation, which was once

considered to be a very useful financial innovation in enabling efficient transfer of risk – and I still think it is a very useful tool – was not handled properly as perverse incentives took over.

13. There were also serious gaps in the regulatory and supervisory framework and philosophy. Let me quickly go through some of the regulatory and supervisory gaps that contributed to the crisis. Most importantly, the capital maintained by banks, was inadequate both in terms of quantity as well as quality. Liquidity buffers were also insufficient as financial institutions operated on the assumption that markets would continue to provide liquidity at all times and hence they financed their long term assets with much shorter term liabilities. The outstanding Repurchase Agreements (repos) tripled between 2001 and 2007 with particularly rapid growth of overnight repos. The financial firms were also excessively leveraged, with the leverage for many commercial and investment banks significantly going up from 2003 onwards. High leverage could be built up by financial institutions while being compliant with the capital adequacy requirement, pointing to serious deficiencies in risk measurement methodologies and models. For example, two large Swiss banks, which were among the best capitalised, also came under stress during the crisis.

14. Lack of transparency in the OTC markets was another major factor which led to build up of risks in the system. Information about the position building was not available even with the regulators, leave alone the counterparties. The insurance giant, AIG wrote huge credit protection (to the tune of USD 400 billion) collecting huge premium in return, believing that it would not be required to settle claims of protection buyers. The quantum of protection sold by AIG was not known to the market participants due to which they went on buying credit protection from AIG. When the system came under severe stress and AIG was required to post higher margins, it found itself in deep trouble and had to be eventually bailed out by the Federal Reserve.

15. Burgeoning under/unregulated shadow banking system added to the forces which exacerbated the crisis. In the run up to the crisis, there was rapid growth in the shadow banking system. In the US, at the peak of credit boom, financing from this sector was much larger than that from the regulated banks. In many advanced economies including the US, the shadow banking system is still larger than the regular banking system. The hands-off approach to the shadow banking system from a regulatory perspective was based on a few assumptions and beliefs. One, the touching faith in market discipline and self regulation, – It was believed that shadow banks would be constrained by market discipline *i.e.,* discipline imposed by banks and other market participants, and also by their own self regulation. Two, it was believed that only banks were important from the financial stability perspective as they held deposits and were at the core of the payment and settlement systems. Three, it was assumed that if banks' exposure to shadow banking system was regulated, it was easy to contain risks in the shadow banking system. Four, it was also believed that regulation of shadow banking system would be very costly, reduce innovation and impede risk transfer.

16. The compensation structure in financial institutions was also seriously flawed as it encouraged perverse incentives and, therefore, was another major reason attributed for the outbreak of the crisis. Participants were paid large bonuses on the basis of short term performance even though the embedded risks could be high which would crystallise later. The compensation structure encouraged private sharing of profits while socialising the losses by taxing the exchequer.

17. The entire regulatory approach in the pre-crisis period was veering towards light touch regulation. There was a touching faith in the efficient market hypothesis which made many believe that markets are self correcting. This belief ignored the well known herd and irrational behaviour of the financial markets. If we look at any risk distribution, there are always fat tails which are on account of irrationality. The negative fat tails are due to excessive pessimism while the positive fat tails are due to exuberance.

18. As far as supervision is concerned, it had its own share of flaws in the pre-crisis period. The role of supervision is to ask questions, when things are going very well. When the financial system or individual entities are not doing well, supervisors will obviously intervene. But supervisors need to be proactive and ask questions when the going is good. It must be confessed, however, that asking questions during good times is difficult as you will be seen as a spoilsport. It is a difficult task. Supervisors have unenviable job on hand. With commercial banks having some smart people, regulators need to be smarter to question them and that is where the issues of skills and technology come in. In the run-up to the crisis, it was observed that the supervisors were staying on the sidelines and not intruding sufficiently into the affairs of participants. They were not being proactive in dealing with the emerging risks and in adapting to changing environment. There was a lack of capacity to identify, or to act on identification. For example, supervisors could not see the risks building up when banks started dealing in very complex products or when banks started relying excessively on short term funding sources for their operations. Supervision was not comprehensive and even when supervisors found some anomaly, it was not taken to conclusion.

19. The effect of crisis on India was, however, relatively muted, as there was no direct exposure to sub-prime assets and the indirect exposure to failed institutions and stressed assets was very small. The Indian growth was largely driven from within based on domestic demand and, more importantly, some of the features of macroprudential regulations were already in place. We have been alert to dealing with systemic risks, both procyclicality and interconnectedness, at least 4-5 years prior to the global crisis. We had also put in place robust OTC market infrastructure and central counterparty mechanisms. We were lucky to have put in place some of the regulations, based on our own perception, that have now been designed internationally. The approach to these issues today is, however, much more structured.

Review of regulatory framework

20. After giving you a background of what caused the crisis, let me now turn to the reforms in regulation put in place globally, drawing lessons from the crisis. Every weakness and flaw that I have mentioned has been tried to be corrected. The Basel III regulations stipulate enhanced quality and quantity of capital. The component of tier I capital as part of total capital has been raised to 6 per cent (out of total 8 per cent CRAR), requirement of equity capital has been raised very substantially to 7 per cent (including 2.5 per cent of capital conservation buffer) from the earlier 2 per cent. There was no concept of capital conservation buffer earlier, though there is something similar in pillar II of Basel II. Pillar II deals with two kinds of risks: (a) the pillar I risks which are not covered under pillar I such as concentration risk and interest rate risk in the banking book, and (b) the impact of a stress situation on banks and estimation of additional capital required for banks to withstand the stress.

21. During the crisis, it was observed that the losses in the trading books of banks were several times the losses as computed by the VaR models. As regards the counter party credit risk, it was found that most losses arose from the mark to market losses due to

deterioration in the credit quality of the counterparties rather than due to outright default. The Basel III regulations have, therefore, expanded the risk coverage, specially, in the trading book and of risks relating to counterparties.

22. As regards liquidity, a global framework has been built for the first time in several years, both in terms of the requirement for banks to have adequate high quality liquid assets to withstand a stress situation over a 30 day horizon and also from the perspective of avoiding asset liability mismatch by requiring banks to fund long term assets with stable funds.

23. In my view, the most important lesson from the crisis is the recognition of systemic risks and the development of a framework to deal with that. I would touch upon these issues briefly, as there is a full session on systemic risk during the course of your conference. Systemic risk has two dimensions – procyclicality that I have explained a little earlier, and interconnectedness. One interesting feature of interconnectedness which is different from knockout effect (impact from one interconnected institution to others in the system), is that it can play simultaneously, or near simultaneously on a large number of institutions through common exposures to an asset or an asset class. For example, if multiple institutions have exposure to an asset and if one of the institutions begins a fire sale of the asset, say, due to a temporary liquidity stress, the consequent fall in the asset prices would force other participants, who are otherwise liquid and solvent, to sell that asset to avoid mark to market losses. This would lead to further erosion in the value of that asset resulting in further losses and more fire sales. Therefore, the rational actions of individual institutions to preserve their self interest could turn out to be a collectively irrational action.

24. As regards procyclicality, since banks face large losses which crystallise during downturn, they have to make larger provisions and provide additional capital. This would constrain their lending activities which in turn would have an adverse impact on economic recovery. Basel committee has, therefore, prescribed building up of countercyclical capital buffers. Banks are expected to build capital buffers during the upturn which could be used during downturn so as to maintain their lending activities which would cushion the impact of a downturn on the economy.

25. Basel Committee has suggested 'credit to GDP' ratio as a metric to calibrate countercyclical capital buffers. The model assumes that deviation from the trend is cyclical and hence should trigger buildup (or release) of buffers. While this model could work for advanced economies, it may not work effectively for emerging market economies like India since, in our context, the deviation in the 'credit to GDP' ratio may not only be cyclical but may have large structural components. EMEs have large segments of population which are still financially excluded. Financial inclusion initiatives which are being taken in these economies would bring a large segment of such populace into formal banking fold, which would result in a sharp jump in the credit to GDP ratio, which could be misinterpreted as cyclical deviation. Further, especially in India, we had taken a big leap in transforming from an agrarian economy to a service oriented economy. With the current initiatives to invigorate manufacturing and infrastructure sectors which are highly credit intensive and are employment generating, the credit to GDP ratio would show a sharp spurt, not necessarily indicating any cyclical trend. We have been, therefore, following a sectoral approach, as a countercyclical policy, modulating risk weights and provisioning requirements for certain sensitive sectors which show signs of overheating. Our approach has been fairly successful, though not equally well in all the sectors that we targetted. While the Basel Committee has not

considered the sectoral approach, the Bank of England has considered it as one of the tools in formulation of its macroprudential policies. In the foreseeable future, the Reserve Bank, in all likelihood, would continue to follow the sectoral approach for dealing with procyclicality. This deviation from the prescribed methodology would be permissible within the Basel Committee's 'comply or explain' framework. However, the downside here is that the deviation from the laid down methodology may be interpreted by markets as non-compliance. To guard against this, we will have to improve and sharpen our communication.

26. Building up of provisioning buffer during good times based on expected loss methodology to deal with procyclicality is another important regulatory construct under Basel III. However, the progress in this area has been very slow and it is still work in progress. As an interim measure, we propose to implement a provisioning methodology similar to the Spanish 'dynamic provisioning', shortly.

27. The countercyclical policies assume a lot of importance, more so for developing countries like India because of the economic conditions of these countries. While the gains from growth take longer time to percolate to all strata of the society, the pains of instability permeate and percolate immediately. Also, costs, in terms of increase in poverty are higher if output falls, than the gains from reduction in poverty for an equivalent rise in output. Financial stability, therefore, assumes great importance for emerging markets. Perhaps this is the reason why macroprudential policies have been practiced in EMEs well before the advent of crisis while the advanced economies have only now begun to practice these policies in the wake of Basel III regulations. I would also like to mention here that while the Reserve Bank is complimented for steering the country safely out of the crisis, it is also, often considered to be very cautious. I believe that we cannot afford to be less cautious as we do not have the wherewithal to sustain or absorb the high costs of misadventure. That is the reason why we became alert and started implementing countercyclical policies much before the onset of the crisis and do not encourage use of exotic financial products.

28. To deal with the cross sectional dimension of systemic risk, *i.e.,* the issue of interconnectedness, the Systemically Important Financial Institutions (SIFIs) have been brought into focus. Global Systemically Important Financial Institutions (G-SIFIs) and Domestic Systemically Important Financial Institutions (D-SIFIs) are the entities that could potentially create larger negative externalities to the financial system if they were to get into trouble and fail. Therefore, it is necessary to stipulate greater loss absorbency for these entities, subject them to more intense supervision and put in place stronger resolution regime. SIFIs are identified based on a metric which takes into account factors such as their global activity, their size, interconnectedness with other segments of the system, their substitutability and the complexity of their operations. G-SIFIs have to maintain additional capital in a range of 1 per cent to 2.5 per cent depending upon their systemiticity. The reason for stipulating higher capital is twofold. One, the higher loss absorption capacity would reduce the probability of G-SIFI's failure and in the event of their failure, reduce the impact of their failure. Second, higher capital requirements would act as an inbuilt incentive for G-SIFIs to reduce their systemiticity. The framework for D-SIFIs is similar but less structured and with larger national discretion.

29. For any regulatory regime to be effective, robust supervisory framework is absolutely necessary. Increasing the intensity and effectiveness of supervision for SIFIs in particular is a key component for reducing the moral hazard and negative externalities posed by these institutions. Towards this, the Basel Core Principles (BCPs) on Effective Supervision- the global standards against which supervisors are

assessed as part of the IMF-World Bank Financial Sector Assessment Program (FSAP) – have been recently revamped. The Joint Forum has published Principles for supervision of financial conglomerates. Several other issues *i.e.* model risk, management, enhanced scrutiny of Boards and senior management, more emphasis on adoption of strong controls by SIFIs, horizontal review, stress testing, supervisory colleges, macroprudential surveillance and examination of risks associated with business models are being addressed.

30. Resolution framework for SIFIs is another critical aspect that is under development. A robust resolution framework needs to be put in place with a view not to burden the Government with the task of bailing out large and systemically important institutions, if they were to fail. A well defined resolution regime enables separation and continuation of core activities from non-core activities followed by an orderly resolution. In this context you must have heard of living wills. FSB is also consulting on guidance on recovery and resolution planning for making operational the *'Key attributes of effective resolution regimes for financial institutions'* which it has published earlier. In the US, under the Dodd-Frank Act, an orderly resolution framework has been put in place.

31. There is also a serious debate on revamping the banking models especially in the context of concerns regarding systemically important and complex institutions. There is an increasing realisation that the retail part of the banking system, which offers core services to the people in terms of deposits and retail credit, should remain safe. There are three well known reports in this regard; Vickers' report in the UK proposes ring fencing the retail business from the investment banking activities. The Volker rule under the Dodd-Frank Act in the US proposes restrictions on proprietary trading with some exceptions and puts limitations on banks sponsoring Hedge funds, Venture Capital funds and Private Equity funds. A recent addition is the Liikanen report for the Euro zone which is on somewhat similar lines.

32. The need to provide oversight to the shadow banking system is another major lesson from the crisis. The shadow banking system grew phenomenally in the run-up to the crisis and overshadowed the regular banking system in many jurisdictions. The risks originated in the lightly, or unregulated shadow banking system, spread to the regular banking system and exacerbated the crisis. Oversight/regulation of shadow banking system was, however, not immediately taken up by the Basel committee as the Committee was preoccupied with the work related to banking regulation which itself was very onerous. With the work regarding revamping of banking regulations largely complete, the FSB and the Basel committee have now focused on putting in place a robust framework for oversight/regulation of the shadow banking system. Improving the oversight/regulation of the shadow banking system assumes all the more importance with the tightening of banking regulations as the widened regulatory gap between the two systems would lend a scope to increased regulatory arbitrage with risks flowing from the more regulated banking system to the less regulated shadow banking system.

33. Regulating shadow banks poses a dilemma. It may not be appropriate to impose bank like regulation on them as it may stifle flexibility and innovation which the sector is known for. At the same time, having widely divergent approach towards this sector which performs bank like credit intermediation would create huge arbitrage opportunities and give rise to systemic risks. There is a two pronged approach that is recommended in this regard: casting the net wide to gather data on all non-bank credit intermediation activities and then narrowing the focus on those non-bank credit intermediaries that have the capacity to pose systemic risk on account of maturity/liquidity transformation and leverage. There are broadly four

graded approaches for oversight/regulation of credit intermediaries. One, indirect approach which involves regulating banks' exposure to shadow banking system. Second, a direct approach where macroprudential measures are taken to address risks in securities lending and repo transactions. The third approach is regulation of shadow banking activities through disclosure obligations and restrictions on activities and the fourth approach is the regulation of shadow banking entities, *i.e.,* imposing bank like regulation on these entities, limiting maturity transformation and leverage. FSB has published the '*Initial Integrated set of recommendations to strengthen oversight and regulation of shadow banking*' and the related responses received. When the final standards are brought out, which is likely in the near future, countries will have to take cognizance of that and build their systems for dealing with shadow banks.

34. In India, about 50 per cent of the shadow banking system consists of Non-Banking Financial Companies (NBFC) which is regulated by the Reserve Bank. The other components largely include insurance and mutual fund participants which are regulated by other regulators *i.e.,* IRDA and SEBI respectively. The regulation of the NBFC sector has been progressively tightened over time. Initially, the regulatory focus was confined to deposit taking NBFCs. But in 2005-06, the focus shifted to non-deposit taking NBFCs which are systemically important due to their interconnectedness. The regulatory regime for such NBFCs was made significantly vigorous. We believe that the tighter regulation of NBFC sector did stand us in good stead during the crisis though it is difficult to argue counterfactually.

35. Improving transparency in the OTC market, standardisation of OTC products and their migration to Central Counter Parties (CCPs) to contain the risk of interconnectedness are major reform agendas. The criticism of this initiative is that by migrating OTC products to CCPs, there is a possibility of warehousing all risks in a few entities leading to systemic risk buildup and adding more 'too important to fail' entities. There is also a serious debate over whether the CCPs that have become systemically important need to be provided central bank liquidity support. While there are strong arguments for providing such facilities to them given their criticality in the financial system, the issue of moral hazard needs to be adequately addressed while providing such support. There are also quite a few areas where work is in progress such as counterparty credit risk, capital for exposures to CCPs, *etc.*

Some dilemmas and debates

36. Having given a broad overview of regulatory reforms, let me now touch upon some of the concerns, misgivings and apprehensions over the implementation of new regulations. The most important concern relates to the adverse impact of higher capital requirements on growth, more so in the case of EMEs. This is a very valid concern. As the capital requirements go up, the cost of operations would increase because equity is costlier. Banks can react to this situation in many ways and in various combinations. They may sell off non-core businesses, reduce their balance sheet by selling off assets, reduce lending operations and increase the cost of lending, *etc.* Some banks may enhance their operational efficiency and improve their competitiveness by absorbing the higher cost of capital. But most likely, the reaction by the majority of banks would be to cut down on lending and increase the lending rates which would adversely impact economic growth.

37. The Basel Committee had set up a Macroeconomic Assessment Group (MAG) to assess the impact of regulations on growth. The Group after an extensive study involving about 100 simulations had concluded that if Basel III requirements are implemented over a

longer period of time (35 quarters), the impact on growth would be minimal (0.03 per cent per annum below its baseline level during this period) and there would be recovery in growth towards baseline after this period. This is considered to be affordable because the long term benefits of stability will far outweigh the costs of instability. That is the reason why the implementation period is so long (6 years).

38. Let me now turn to a few structural issues. One issue that is being debated is the optimal level of financial activity. We found that, prior to the crisis the financial world had acquired a life of its own, dissociated from the real sector. There was too much of complexity. The lessons from the crisis emphatically point to the fact that finance should serve the needs of the real sector and be subservient to the needs of real economy. There have also been concerted efforts to reduce the complexity of financial products. One such measure is the moving of OTC products to exchanges by standardising them and settling them through central counterparties (CCPs). While there would always be a place for customised (OTC) products, regulators and supervisors will have to ensure that these products do not become unduly complex.

39. There is another line of research that is gaining prominence in the recent times. The issue is whether too much of finance is good for growth. Recent analysis shows that at low levels a larger financial system goes hand in hand with higher productivity growth but there comes a point where more banking and more credit are associated with lower growth. This happens essentially due to the diversion of resources- physical and human- away from the real sector to the financial sector.

40. Another issue relates to the dilemma whether we need larger banks. The lesson from the crisis is that very large institutions (SIFIs) pose significant risks to the financial system. But some argue that to remain competitive, banks need to grow larger to achieve the benefits of economies of scale and scope. Therefore, the question is of the optimal size a financial institution should be allowed to grow to. How large is really large? I do not think anyone has a categorical answer to that. One alternative could be to focus not on size but on the structure of the institutions and discourage complex structures. The problem I find with the metric used for measuring the systemiticity of financial institutions is that it is not an absolute metric but a relative metric. It calculates the systemiticity of a bank in relation to the global sum of various metrics. In this relative approach, there is always a possibility that a bank, despite growing rapidly, and becoming riskier, might escape the SIFI regulation, if the entire banking system also becomes riskier due to which its 'score' remains unchanged. I must add that the methodology devised by the Basel Committee is the best available at the moment. To take care of the developments in the banking system, such as the one I have mentioned, the methodology provides for periodic review every three years. However, having a metric that computes systemiticity as an absolute measure would be much better and is an area that needs further research.

41. The role of monetary policy in dealing with asset bubbles is another actively debated issue. Earlier the prevailing notion was that monetary policy neither had the mandate nor the ability to contain asset bubbles. All that it was expected to do was to mop up the debris after the bubble burst. But post crisis, there is an increasing consensus that monetary policy does have a more symmetric role in dealing with asset bubbles and it must work in tandem with the macro prudential policies for ensuring financial stability. Since both monetary policy and the macroprudential policies work towards ensuring similar outcomes and they both affect the same variables, *i.e.*, the volume of credit and the price of credit, the cost to the economy

would be higher, if both the policies were to work at cross purposes with each other. Pure inflation targetting which was the prevailing orthodoxy prior to the crisis is getting modified and now it is accepted by many that pure inflation targetting is not the ideal approach in the context of financial stability. The debate, however, by no means, is fully settled.

42. Another question that crops up in this context is that who should have the mandate for financial stability. Should it be the central bank or should it be the government or should it be an independent outside agency. Post crisis, several models have evolved and most of them are collegial, with participation from the central bank, the government and other regulators. There is another view that supports vesting the financial stability responsibility with central banks. This is the case with some countries, for example, UK and Malaysia. The reasons are not very difficult to see. As I mentioned earlier, monetary policy and macroprudential policies need to work in tandem to ensure financial stability. Monetary policy is the domain of central banks. Further, central banks, by virtue of their mandate for conducting monetary policy, have a handle on macro economy and financial markets. Central banks have fair knowledge of the financial institutions also to a large extent, even in cases where they are the not the regulators and supervisors. Therefore, Central banks appear to be the ideal choice for ensuring financial stability or at least play a vital role in a collegial approach.

43. Unlike inflation targeting where a single number is fixed to measure the effectiveness of the policies, there is no such thing in macroprudential policies. The success of the macroprudential policies cannot be established based on counterfactuals. Therefore, to ensure proper accountability, a clear communication of objectives and methodology for fixing accountability is extremely necessary.

44. As regards liquidity risk, while the framework for Liquidity Coverage Ratio is in place, there are issues regarding interaction between LCR and monetary policy. These issues are being examined.

45. The implementation of Basel III itself is generating a debate. It was earlier planned to be implemented from 1st January 2013. Though our financial year commences on 1st April, for the sake of converging our implementation schedule with the international schedule, we had proposed to implement it effective 1st January 2013. But the two most important jurisdictions *viz.*, the US and the Euro zone that are expected to be in the forefront in implementing Basel III, could not adhere to the schedule. We have, therefore, shifted our implementation date to April 1, 2013 which suits us better. I feel that for smoother implementation of Basel III, it would be helpful if the US and the Eurozone could announce a firm date for commencement of implementation with no change in the final date of implementation, *i.e.,* December 31, 2018.

46. The increasing complexity of regulations has raised an interesting debate as to whether more complex regulations are necessarily more effective and whether they achieve their regulatory objectives. There is an interesting paper by Andrew Haldane, Executive Director of Bank of England, ' *The Dog and the Frisbee*' which makes the point that the increasing complexity of regulations is actually counterproductive. He has argued that simple leverage ratio has been a more effective predictor of stress in the system during the crisis than the complex risk weighting system and therefore simple risk measures should be preferred over complex measures for regulatory purposes. Another problem with risk weighting is that similar or identical portfolios are found to show very divergent capital requirements reflecting the fallibility of risk models. My personal view in this regard is that since financial systems have become very complex, simple

risk measures may not suffice. Further, no single metric would be sufficient as it would likely be gamed. My conjecture is that if the evidence shows that the simple leverage ratio was a more effective predictor of stress in banks, it could, perhaps, be because it was not a closely watched metric. The moment regulations are built around one metric, there would be incentive to game it. Further, the downside of simple leverage ratio is that there would be strong incentive for banks to have riskier portfolios for a given amount of capital. The solution, therefore, would lie in combining the leverage ratio with risk based measures and making the models more robust and transparent.

47. Consolidation is another issue that is extremely important but has not received adequate focus so far. Specifically, while dealing with SIFIs, a consolidated/group based approach is adopted to assess the overall risk but the crisis has shown that laws relating to consolidation have been inadequate. In most jurisdictions, consolidation is based on accounting rules and the accounting rules need not be the best solution for prudential requirements. Based on the lesson from crisis, there was a need to better align the accounting rules for consolidation with the prudential objectives. In fact, the IASB has revised the consolidation standards through IFRS 10. Even though IFRS 10 has been introduced, much work needs to be done from a prudential perspective framing consistent consolidation guidelines. Let me briefly touch upon major changes in the new accounting guidelines related to consolidation. The definition of control has been redefined in the revised accounting guidelines. So far, control was being largely defined in terms of having more than 50 per cent of voting power through equity holdings or otherwise. In IFRS 10, control is defined from a different perspective in recognising the possibility that even an investor holding less than a majority of the voting rights could have control. Illustratively, IFRS 10 recognises a situation where an investor with less than a majority of voting rights may have the practical ability to direct the relevant activities of the investee unilaterally if the size of his/her vote-holding is *relatively large* in comparison to the other vote-holders and the vote-holding of the others is so widely dispersed that several of them would need to act together to outvote this investor.

48. Large exposures is another important area where Basel committee has set up a working group. The regulatory practices regarding large exposures are quite divergent. For example, many jurisdictions allow for collateral adjustment while computing the exposure while others, including India do not. The exposure limits also vary considerably. There is a need to set standards.

49. Let me now deliberate on supervision and the recent thinking and changes in this area. Supervision has to be central to any effort to make the financial system safer and has to be effective for any regulatory initiative to succeed. Writing rules (regulation) is tough, but it is tougher to make the financial institutions adhere to those rules, for which a very effective supervisory mechanism is needed. What are the important components of effective supervision? Let me quote from an IMF Staff Position Note[1] which very lucidly explains the attributes of effective supervision. Good supervision has to be intrusive. As I mentioned earlier, supervisors need to ask the right questions when the going is good. Good supervision has to be skeptical but proactive, implying that the supervisor should not take things for granted. Good supervision is comprehensive: while dealing with a bank, supervisors need to look holistically at the group level. Good supervision is adaptive: as the financial system is very dynamic and fast moving and innovations happen all the time, supervisors need to be alert to

[1] The making of good supervision: Learning to say 'No'; Jose Vinals and Jonathan Fiechter, IMF Staff Position Note, SPN/10/08.

the developments and be updated. Good supervision is conclusive: supervisors need to take their findings to logical conclusion through further probing or deliberations and discussions. On top of these attributes, the IMF note mentions two features that signify good supervision. One, the ability to act and second, the will to act. Ability to act is based on the legal authority and the necessary resources both in numbers as well as quality. Availability of skills is an extremely important factor. This requires an efficient HR planning in terms of skill building and good compensation policies. Ability to act also hinges on effective working relationships with other regulators especially for supervising entities that have cross border presence. The willingness to act, on the other hand, hinges on factors such as a clear and unambiguous mandate, operational independence, accountability, a healthy relationship with the industry, *etc.*

50. The other actively debated issue about supervision is whether it should be vested with the central bank. Different jurisdictions have different practices. There are jurisdictions where supervision is the sole responsibility of Central bank, while there are other jurisdictions where the responsibility is shared among multiple agencies and in some other cases, supervision is fully outside of central bank. FSA model which was based on unified approach to supervision outside of central bank gained a lot of respectability in the period prior to crisis. However, our own experience and the experience gained during the crisis have driven home the point that there is a lot of merit in vesting the supervisory responsibility for the banking system in the central bank. The carving out of Prudential Regulatory Authority (PRA) from the FSA in UK and the PRA becoming a subsidiary of the Bank of England is a case in point.

51. Post crisis, there has been a shift towards risk based supervision (RBS) away from the erstwhile CAMELS approach. CAMELS is essentially a scorecard based approach which is more of a backward looking methodology and transaction testing model operating with a lag. The RBS, on the other hand, is a forward looking approach inasmuch as it assesses the risk buildup in banks. RBS also enables conservation of supervisory resources. I am a votary of a combined approach. I feel that even while following the CAMELS approach, the distribution of risk and its direction should be assessed which would result in a more comprehensive assessment of banks. Under the RBS, supervisors essentially rely on the inputs provided by banks' risk management systems. Therefore, the RBS can only be as effective as banks' risk management systems. The RBS can be supplemented by thematic assessments which can address risks arising through common exposures and common causes. Supervisory methodology is under considerable focus and it needs to be constantly evaluated and improved upon to make the financial system safer as only framing regulations will not suffice.

52. Lastly, let me mention the importance of stress testing. The risk models have their own limitations, due to behavioural aspects, as I have mentioned earlier. Stress testing is an important risk management tool to enable the supervisors to know what happens in the tails.

53. I would end my address by a quote I came across recently '*In every crisis there is a message. Crises are nature's way of forcing change-breaking down old structures, shaking loose negative habits so that something new and better can take their place*'[2]. Let us carry the message and lessons offered by crisis and move forward in building a more robust and resilient financial system.

Thank you.

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2 Susan L. Taylor

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*Governance in Banks and Financial Institutions**

Anand Sinha

Shri Deosthalee and senior management of L & T. A very good evening. I deem it a privilege to address you this evening on '*Governance in banks and financial institutions*'.

2. Governance issues have been engaging the attention of policy makers, more intensely in the aftermath of the global financial crisis. Many instances of governance failures have come to the fore as the contributory factors that had exacerbated the crisis. With lessons learnt from the crisis, the framework is being revisited so as to strengthen the governance standards.

What is Governance?

3. What exactly is Governance? Governance, in general terms, means the process of decision making and the process by which decisions are implemented (or not implemented)[1], involving multiple actors. Good governance is one which is accountable, transparent, responsive, equitable and inclusive, effective and efficient, participatory and which is consensus oriented and which follows the rule of law.

4. The 1992 Report of the Committee on the Financial Aspects of Corporate Governance (Cadbury Report) describes corporate governance as the system by which companies are directed and controlled. As per Organisation for Economic Cooperation and Development (OECD), Corporate Governance involves[2] '*a set of relationships between a company's management, its board, its shareholders and other stake holders. Corporate Governance also provides the structure through which the objectives of the company are set, and the means of attaining those objectives and monitoring performance are determined. Good corporate governance should provide proper incentives for the board and management to pursue objectives that are in the interests of the company and its shareholders and should facilitate effective monitoring. The presence of an effective corporate governance system, within an individual company or group and across an economy as a whole, helps to provide a degree of confidence that is necessary for the proper functioning of a market economy.*'

5. The whole gamut of corporate governance could be considered as a blend of various segments[3] namely, regulatory governance, market governance, stake holder governance and internal governance. For an economy to perform well and for the financial system to be stable, good corporate governance would be required across all these segments. Regulatory governance refers to control exercised by regulators over firms through statutes, policies and regulations. Market governance denotes the use of market-based controls which discipline the corporate behaviour. While stakeholder governance alludes to the direct or indirect control by various stakeholder groups having direct or indirect interest in the corporations, internal governance refers to the institutional arrangement of checks and balances within the corporation.

Why is corporate governance important for financial institutions?

6. While good governance is essential for any entity, it has deeper significance for financial institutions. There are many compelling reasons, some of which are:

a. Financial institutions are central to economic activity – banks and a large part of the non-

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1 United Nations Economic and Social Commission for Asia and the Pacific, '*What is good governance*'.

2 OECD Principles of Corporate Governance(2004).

3 Sun, Willian, Stewart, Jim and Pollard, David; '*A systemic failure of corporate governance: Lessons from the on-going financial crisis*'.

banking financial system (the shadow banking system) undertake credit intermediation. Failures of financial institutions would thus impede the economic growth and would cause serious damage to the system. Economies take longer time to rebound from financial crisis than the business cycle recessions.

b. Financial institutions operate on a higher leverage. As per a study by the Bank for International Settlement (BIS) for the period 1995-2009, compared to non-financial institutions that had a leverage of about 3, banks operated at a leverage of 18.3 while non-bank financial firms had a leverage of 12.1. Higher leverage makes financial intermediaries more vulnerable to shocks. From a systemic perspective, the inherent procyclicality of the financial system leads to the build up of high leverage during upturn phase of the economy which amplifies booms and busts. Therefore, while the procyclicality issues need to be dealt with from a financial stability perspective, it is apparent that these financial institutions must be well governed for achieving financial stability.

c. Financial institutions, especially banks, deal in people's savings and trust of customers forms the cornerstone of their existence. Any breach of trust leading to loss of confidence is bound to lead to a *run*, not just on a particular bank but on others too who are perceived to have weakness or even similar business models. The non-bank financial intermediaries who lose the trust of their lenders would not be able to raise resources at a reasonable cost making it hard for them to operate efficiently and profitably. All these can lead to snowballing effect impairing the functioning of the entire financial system due to interconnectedness. Good governance ensures customers' and other stakeholders' trust in banks and non-banking financial intermediaries.

d. Among the financial intermediaries, banks occupy a special place due to their centrality in the transmission of monetary policy and the functioning of the payment and settlement systems. They also are the beneficiaries of deposit insurance which may weaken their incentive for strong management monitoring as well as monitoring by other stakeholders including depositors. Good corporate governance would ensure strong internal controls which would offset the weakened incentive for monitoring. A robust and stable banking system is an absolute necessity for a well functioning economy.

Corporate Governance – International Experience

7. Academic literature suggests that post-2000, significant developments happened in the corporate governance framework internationally. For example, in the US, corporate scandals including Enron and World Com resulting from failure in corporate governance, led to Sarbanes–Oxley Act with an aim to improving the accuracy and reliability of corporate disclosures by way of enhanced oversight role of Boards, corporate responsibility, certification of accuracy of financial transactions by Top Management, setting standards for auditor independence, *etc.*

8. However, it is widely acknowledged that even the enhanced framework could not mitigate the weaknesses which played a significant role in contributing to the global financial crisis (GFC). There are ongoing debates regarding the manner in which flawed governance practices played their part in the crisis. While poor implementation is blamed by some, systemic failure of corporate governance is attributed by others as the cause. OECD and UK Financial Regulatory Council share the view that the shortcomings were not with the Corporate Governance codes/principles *per se*, but were in their implementation.

Governance and Ethics

9. Lack of ethics too played a significant part in the erosion of governance standards in institutions. Values and culture define ethics. Ethics are principles that recommend proper conduct, help distinguish right from wrong and drive people to do the right thing even when no one is looking. While ethical behaviour is a minimum requirement for any dealing or transaction, it becomes all the more essential for financial intermediaries, and particularly for banks, for whom trust is the cornerstone. Honest and prudent behaviour by banks and other financial intermediaries is integral to their reputation and public confidence in the system.

10. However, the conduct of financial institutions that caused the crisis does not suggest any measure of enduring interaction between ethics and banking. In fact, financial markets and entities displayed significant moral bankruptcy through the period spanning pre-crisis, crisis year and beyond.

11. Some of the recent high profile events have emphatically highlighted the complete lack of ethics in some financial institutions. London interbank offered rate (LIBOR) rigging episode wherein a few financial institutions colluded in rigging the LIBOR so as to profit from the trades or to give an inflated impression about their creditworthiness shook the world. LIBOR is one of the most important interest rates and is used for pricing of about US$ 800 trillion worth of financial instruments (reportedly 11 times the GDPs of all nations on earth). There are several such episodes.

12. Closer home too, in India, we have witnessed a few high profile cases which have shaken the public trust in the financial system. Satyam, once regarded as having good corporate governance, was found to have been deeply involved in one of India's biggest corporate frauds. The 1992 securities scam which brought out the nexus between bankers and brokers led to massive overhaul of the financial system in India. The unethical practices adopted by some banks in recent past in selling inappropriate financial products (exotic derivatives) to their corporate customers and the unfair and unscrupulous methods adopted by some microfinance institutions (MFIs) in their operations are some recent reminders of erosion of ethics in the financial system.

Causes of governance failure

13. A systemic failure of corporate governance means the failure of the whole set of regulatory, market, stakeholder and internal governance, which has largely contributed to the on-going financial crisis[4].

a. *Regulatory governance failure*: The regulatory framework in the pre-crisis period was veering more towards deregulation and liberalisation. The Chinese wall that separated investment banking from retail banking was brought down with the repeal of Glass-Steagall Act of 1933 which led to the proliferation of universal banks. While this enabled the institutions to achieve economies of scale and scope, it also led to transmission of risks of investment banking into retail banking. The exemption from regulation of OTC derivatives enabled by the passage of Commodity Futures Modernisation Act 2000 is alleged to have encouraged excessive trading in Credit Default Swaps which were an important feature of the global crisis. Other regulatory dispensations such as permitting banks to move massive amounts of assets and liabilities off balance sheet through structured investment vehicles also fuelled the crisis. Further, the regulatory gaps which led to proliferation of shadow banking entities have also been significantly instrumental in exacerbating the crisis. There were lapses in the supervisory framework also. In the run-up to the crisis, it was observed that the supervisors were staying on the sidelines and not intruding sufficiently into the affairs

4 Sun, Willian, Stewart, Jim and Pollard, David; *'A systemic failure of corporate governance: Lessons from the on-going financial crisis'.*

of participants. They were not being proactive in dealing with the emerging risks and in adapting to changing environment. There was a lack of capacity to identify, or to act on identification. For example, supervisors could not see the risks building up when banks started dealing in very complex products or when banks started relying excessively on short term funding sources for their operations. Supervision was not comprehensive and even when supervisors found some anomaly, it was not taken to conclusion.

b. *Market Governance failure*: The prevailing dogma prior to the crisis was that markets were always right and will find their own balance, left to themselves. There was unflinching faith in the invisible hand of markets, despite the well known fat tails in statistical distributions representing herd behaviour of markets signifying irrationality driven by excessive optimism or pessimism. However, the crisis established that markets are indeed fallible. As observed by Joseph E. Stiglitz, a Nobel laureate in economics, when information is imperfect, markets do not often work well and information imperfections are central in finance.

c. *Stakeholder governance failure*: The crisis has also highlighted the failure on the part of various stakeholders who did not have active involvement in corporate governance.

d. *Internal Governance failure*: It is observed that the lapses in internal systems and controls such as Board oversight, managerial competence, compensation policies, audit *etc.* were instrumental in exacerbating the crisis.

14. Let me now briefly touch upon some of the specific internal governance failures in the financial institutions that have contributed to and/or exacerbated the crisis.

a. *Complex and opaque organisational structures*: There was a massive growth in the complexity of organisational structures in the pre-crisis period, with a view to taking advantage of regulatory arbitrage and also of gaps in regulations. Regulators found it difficult to look through the structures and enforce regulation. Many times, such complex structures fell in the gaps between regulatory jurisdictions and escaped regulations.

b. *Inadequate Oversight by Board*: Boards were found to be not actively involved in formulating risk appetite framework of firms. Incomplete risk information due to gaps in MIS coupled with inadequate understanding of risk due to the lack of expertise among the directors, hampered effective and timely decision making. Improper pricing of risk led to suboptimal allocation of capital and inadequate preparation for the tail events eventually leading to the precipitation of the crisis.

c. *Weaknesses in the Senior Management:* Senior management failed to adopt and integrate necessary systems to identify, manage and report risk. The misalignment of incentives also resulted in the management pursuing objectives which, at times, were at cross purposes to those of the firm.

d. *Proliferation of complex products*: There was a significant spurt in the complexity of financial products in the run-up to the crisis. Abundance of cheap liquidity prodded the participants to innovate ways to deploy the funds and earn a return. Complexity and opacity led to inadequate understanding and mispricing of risk. The long chain of transactions also obfuscated the true risks inherent in the transactions and led to a false sense of comfort.

e. *Flawed remuneration policies:* Compensation structures which focussed excessively on short term performance incentivised managers to take excessive risks in order to meet the short term objectives at the expense of long term sustainability of the firm. Further, the framework where the participants get to keep the gains while the losses are assured to be borne by the society (either explicitly by the government guarantee or implicitly due to the inevitable governments' intervention to bail out due to systemic concerns), was an incentive for participants to take-up risky activities. Equity incentives, put in place with the objective to align managers' incentives with those of shareholders, may also have induced managers to take excessive risks.

f. *Weak risk management systems and internal controls:* With significant developments in technology, risk management in the run up to the crisis became highly quantitative on the lines of an exact science. Models proliferated with a false assurance to capture and measure every kind of risk. It is said that economists suffered from a syndrome of Physics *envy.* The models tried to anticipate the future based on assumptions of normality and on the basis of past data. In their exuberance, quants, however, forgot that the assumption of normality does not correspond to reality, particularly, in highly stressed situations. For example, the probability of a 5-sigma loss on any given day would mean that such an occurrence should happen once in about 14,000 years (assuming 250 trading days in a year) that is much longer than the period of time that has elapsed since civilisation evolved[5]. During the crisis the Wall Street Journal (2007) reported that events that models predicted would happen only once in 10,000 years, happened everyday for 3 days. Further, the assumption, or rather the dogma, which was the basis of many models, that future could be predicted on the basis of past data, led to disastrous outcomes. With the rapid development of technology, increased integration of markets and entry of sophisticated players, the present and the future are much different from the past and it would be very naïve to predict the future based on the past data.

g. *Inadequate emphasis on financial literacy and consumer protection:* While the complexity of financial products was increasing, inadequate attention was paid to imparting financial education to the public. Financial literacy would not only to enable customers to make use of the available products but, more importantly, help them understand the inherent risks in the products and to guard themselves if the financial institutions indulged in mis-selling and other unfair practices.

International initiatives in strengthening corporate governance

15. Global crisis has highlighted the significance of good corporate governance for the survival and well functioning of financial institutions. The Senior Supervisors' Group's Report '*Observations on Risk Management Practices during the Recent Market Turbulence'* (March 2008) confirms that the financial institutions which survived the crisis better were those who had, among others, informative and responsive risk measurement and management reporting and practices. The blend of qualitative and quantitative analysis provided a high level of insight and consistent communication to management of evolving conditions, enabling the firm to respond effectively to emerging opportunities and risks.

5 Dowd, Kevin and Hutchinson, Martin, '*Alchemists of Loss*', Times Group Books.

16. With lessons drawn from the crisis, policy makers have revisited the extant corporate governance framework and have issued guidance with a view to addressing the gaps witnessed and strengthening the governance framework. The OECD Steering Group on Corporate Governance, which examined the governance failures, observed that while the corporate governance weaknesses in remuneration, risk management, board practices and the exercise of shareholder rights had played an important role in the development of global crisis, the OECD Principles of Corporate Governance issued in 2004, nevertheless, provided a good basis to adequately address the key concerns that have been raised and that there was no urgent need for them to be revisited. The Group opined that the more urgent challenge was to encourage and support the implementation of already agreed international and national standards including the OECD Principles of Corporate Governance. Basel Committee on Banking Supervision (BCBS) has revisited its 2006 guidance on corporate governance and brought out *Principles for enhancing corporate governance* (October 2010). The Financial Stability Board (FSB) has, in its progress report to the G20 Ministers and Governors (November 2012) also made recommendations relating to the corporate governance issues of systemically important financial institutions (SIFIs).

Risk Governance

17. There is an enhanced realisation that the risk governance demands a holistic approach and that risk appreciation should start at the top. A strengthened management information system (MIS) supported by robust information technology platform is a necessary pre-condition for enhancing Board efficiency in oversight and decision making. Similarly, augmented skill sets and experience at the level of independent directors would go a long way in enhancing the Board capacity. Strong MIS facilitates risk reporting to the boards in an effective and comprehensive manner, which in turn enhances transparency and causes informed decision taking. Robust information technology systems are a necessary condition for supporting the MIS framework as the quality of risk information that the Boards and the top management receive depends largely on the quality and robustness of the information technology systems[6].

18. In addition to prescribing the risk appetite for the institution, the board also needs to lay down appropriate risk strategy and ensure that this is institutionalised throughout the organisation. This would entail, aligning risk management processes with the overall business strategy, clearly defining the roles and responsibilities down the hierarchy, establishing accountability and reinforcing change with communication and training. The Board and the senior management oversight must be supplemented with effective leadership by the Chairman and the chief executive officer (CEO), and informed non-executive directors. The Boards must get much more intimately involved in risk matters and have a firmer understanding of the key risks faced by the business.

19. Effective risk governance also demands that each director is aware of the breadth of risks faced by the bank. Directors add value to the Board when they have financial expertise, are aware of risk fundamentals and techniques, and are able to manage dynamics with executives.

20. Board level risk committees have an important role to play in the overall risk governance framework. Apart from monitoring the firm's strategic-risk profile on an on-going basis, such committees would also be responsible for defining the firm's overall risk appetite; approving major transactions above a firm's risk threshold, and; establishing limit structures and risk policies for use within individual businesses.

21. Presence of a Chief Risk Officer (CRO) is expected to strengthen the risk management framework. However, independence of the CRO, with necessary stature to influence decisions, would be a critical

6 Group of Thirty, '*Toward Effective Governance of Financial Institutions*'

element in ensuring the effectiveness of the post in risk management process as also the strategic risk management related decisions. The CRO must report directly to the CEO and the Board and be responsible for all risks, risk management and control functions. Another important requirement is integrating risk with business strategy and compensation. Risk – and return on risk – need to be core component of any performance measure, and should be explicitly factored into incentive and compensation schemes. Compensation must be formally aligned with actual performance, such as through adding more rigorous risk-based measures to scorecards. This would also involve moving to longer vesting periods, and increasing deferred compensation.

22. The fragmented organisation of risk data into separate silos slows down risk management process and hinders the capability to respond to new regulatory requirements. The financial crisis has pushed both supervisors and market players to move towards an integrated approach to risk data that brings down the silos in organisation. Only by integrating data models, processes and methodologies can a bank achieve higher performance in terms of data quality.

23. The risk management systems must take into account the technical limitations of risk models, such as Value at Risk (VaR). Stress testing and scenario analysis need to be established as truly effective management tools and should be integrated and standardised across business lines, types of risk and asset classes.

Financial Stability Board (FSB)'s thematic review on risk governance

24. The Financial Stability Board (FSB) in its Thematic Review on Risk Governance[7] has observed that since crisis, national authorities have taken several measures to improve regulatory and supervisory oversight of risk governance at financial institutions such as developing or strengthening existing regulation or guidance, raising supervisory expectations for the risk management function, engaging more frequently with the board and the management, and assessing the accuracy and usefulness of the information provided to the Board to enable effective discharge of responsibilities. The evaluation also found that in many jurisdictions, the governance practices are more advanced that those prescribed under national guidance. This, the report opined, may have been motivated by firms' need to regain market confidence rather than regulatory requirements. The results of the Review support the finding that the firms in the regions hardest hit by the financial crisis have made the most progress.

25. However, there are significant gaps relative to the criteria developed, particularly in risk management. The report points to the differences in progress across regions. While firms in advanced economies have adopted more of the desirable risk governance practices, nearly 65 per cent of the firms that reside in emerging market and developing economies (EMDEs) did not meet all of the criteria for the risk management function. The report notes that more work needs to be done in the areas such as elevation of CRO position, establishment of an effective risk appetite framework (RAF), improving the chief audit executive (CAE)'s access to directors beyond those on the audit committee, *etc.*

Indian Scenario

Corporate Governance of Banks

26. Banking regulation in India shifted from prescriptive mode to prudential mode in 1990s, which implied a shift in balance away from regulation and towards corporate governance. Banks are accorded greater freedom and flexibility to draw up their own business plans and implementation strategies consistent with their comparative advantage. This freedom necessitated tighter governance standards requiring bank boards to assume the primary responsibility and the directors to be more knowledgeable and aware and also exercise informed

7 Financial Stability Board (Feb 2013), *Thematic Review on Risk Governance, Peer Review Report.*

judgement on various strategies and policy choices. With a view to strengthen corporate governance, over a period of time, various guidelines have been issued in matters relating to the role to be played by the Board, fit and proper criteria for the directors of banks, bifurcation of the post of Chairman and Managing Director (CMD), remuneration *etc.*

27. Recognising that ownership of banks by one or few individuals could be detrimental to the public interest, especially, depositors' interests, it is stipulated that, in India, banks should have a diversified ownership model. To ensure that ownership and control of banks are well diversified, guidelines on ownership and governance in private sector banks were issued by the Reserve Bank in February 2005. Another important regulatory prescription in this regard is the requirement of Reserve Bank's prior approval for any acquisition of shares in private sector banks resulting in a shareholding of 5 per cent or more of the total paid up capital of the bank.

28. The importance of diversified ownership is also underlined in the recent guidelines on new bank licenses wherein it is stipulated that Non-Operative Financial Holding Companies (NOFHC) which set up new banks should, after the initial lock in period of five years, bring down their equity capital of the bank from the minimum 40 per cent while setting up to 15 per cent within 12 years. To ensure 'Fit and Proper' status of the groups that would set up new banks, it is also stipulated that entities/groups should have a past record of sound credentials and integrity, be financially sound with a successful track record of 10 years.

Corporate Governance of Non-Banking Finance Companies (NBFCs)

29. Traditionally, Non-Banking Finance Companies (NBFCs) in India were small family run businesses some of which accepted deposits and engaged mainly in activities such as lending. Over the years, the NBFC sector has not only grown in size but also in terms of interconnectedness and systemic importance. Today, even though the sector has a total asset size constituting just above 12 per cent of that of scheduled commercial banks, some of the NBFCs have grown very big and are operating as conglomerates with business interests spread across insurance, broking, mutual fund, real estate, *etc.*

30. Keeping in consideration the growing significance of NBFCs in the financial system and their interconnectedness with the banking sector there is a strong case for strengthening their governance framework so as to not only protect the individual institutions and their depositors, but also to ensure the stability of the entire financial system. Further, NBFCs have exposures to sensitive sectors such as real estate and capital markets and they also rely on wholesale funding, all of which point to the requirement of robust internal controls and governance framework to ensure their stability.

31. During the crisis, while none of the shortcomings as observed globally during the GFC manifested in any significant way in the Indian NBFC sector, a temporary crisis of confidence did emanate which affected some of the NBFCs. The lack of confidence exposed the shortcomings in the funding model and consequent problems in the overall risk management framework of these NBFCs which were relying heavily on short term wholesale sources such as mutual funds to fund long term assets.

32. Further, certain shortcomings in the corporate governance were observed in a section of NBFCs *viz.*, those in the microfinance institutions (MFI) sector, leading to near collapse of the sector. Distorted financial incentives such as short term profit maximisation/ undue profiteering and excessive managerial compensation that were the hallmarks of the GFC were the leading contributors to the MFI crisis. The corporate governance issues in the MFI sector were exacerbated by some of the *'for profit'* MFIs, dominated and controlled by promoter shareholders which led to inadequate internal checks and balances over executive

decision making and conflict of interests at various levels. Other undesirable practices such as connected lending, excessively generous compensation for senior management and founders/directors and the failure of internal controls leading to frauds, precipitated the crisis. Some of the MFIs are also alleged to have chased high growth trajectory at the expense of corporate best practices.

33. While drawing comparisons between the US subprime crisis and Indian MFI crisis, in an article titled '*Microfinance Industry in India: Some thoughts*' in Economic and Political Weekly (EPW) (October 8, 2011), Dr. Y. V. Reddy, former Governor, RBI, had observed that opaque practices, high salaries and commissions including unethical business and leverage were prevalent in MFIs.

34. Recognising the significance of NBFCs in the overall financial system, measures were undertaken to strengthen the regulatory framework in terms of stipulation of capital adequacy and exposure norms in 2006. Subsequently in 2007, guidelines on corporate governance for NBFCs were issued by the Reserve Bank of India. The listed NBFCs were already required to comply with the provisions of the Listing Agreement of the Securities and Exchange Board of India (SEBI), others being governed by the relevant provisions in the Companies Act, 1956.

35. While the frameworks laid down by the various regulators/Companies Act may appear similar and over lapping in some areas, there are a few differences. Companies Act does not differentiate between financial, non-financial companies and SEBI Guidelines are generally from the perspective of investor protection with emphasis on disclosure and transparency. Therefore, RBI being the prudential regulator of NBFCs, additionally lays emphasis on risk management framework and the business practices *etc.* and its framework is mainly from the angle of depositor/ customer protection. Reserve Bank's guidelines on corporate governance are applicable to only NBFCs with certain threshold of business, *i.e.,* with a certain deposit base or asset size.

Recent developments in NBFC sector

36. The Reserve Bank has recently issued draft guidelines on corporate governance of NBFCs based on the recommendations of the Working Group on the issues and concerns in the NBFC sector (Chair: Ms. Usha Thorat). The guidelines aim to fine tune the framework for NBFCs by aligning the same with the businesses that they deal in and the growth in size, interconnectedness and systemic importance of the sector. The Guidelines address issues such as multiple directorships, continuing due diligence process with a reporting requirement to RBI, self certified '*fit and proper*' criteria and disclosures that are specific to NBFCs' business, such as disclosures on provision coverage ratio, Asset Liability profile, movement of NPAs, off-balance sheet exposures, structured products issued by them *etc.* Other requirements include prior approval of RBI for change in control of any registered NBFCs. It is indicated that big NBFCs with asset size of Rs. 1000 crore and above would require prior approval of RBI for appointment of CEO and would need to comply with Clause 49 provisions (of SEBI listing agreement) even if unlisted. NBFCs with asset size of Rs. 100 crore and above would be required to comply with the disclosure requirements specified in Clause 49 and of certain financial indicators.

37. Given the recent episodes in the MFI sector, the corporate governance guidelines for MFIs have also been revamped. Measures are aimed at checking undesirable business practices like multiple lending, alleged coercive practices and charging excessive interest rates, *etc.* The guidelines are aimed at enhancing the 'self discipline principle' in these NBFCs. Measures include pricing of credit, restricting lending to a borrower by not more than two MFIs, sharing credit information with a Credit Information Bureau, review of Fair Practices Code (FPC) *etc.* A Self Regulatory

Organisation (SRO) also is envisaged for the sector as a watchdog. While the final framework is still being evolved, the role envisaged for the present, *inter alia*, is to ensure good governance in the industry by way of client protection with enforcement powers to check violations to codes of conduct/regulations.

Conclusion

38. Governance, like regulation, is an evolving concept and is continuously fine tuned to suit the dynamic economic and business environment. Global financial crisis has given us an opportunity for strengthening both the regulatory as well as governance frameworks, by highlighting gaps that exacerbated the crisis. There is an interesting debate over whether and how much regulation can substitute board level governance. While regulation is imposed from outside, corporate governance is internal and is more in the nature of self regulation which ensures that the principles and rules laid down by the regulations are scrupulously adhered to. Prior to the crisis, the emphasis was increasingly on self regulation through robust corporate governance so that the regulation could remain largely principle based and less prescriptive. However, serious lapses observed in governance framework during the crisis, tilted the balance in favour of more rigorous regulation. I am of the view that both regulation and corporate governance have to complement each other. Effective regulation furthers corporate governance and effective corporate governance ensures that the objectives of the regulation are met, with minimal regulatory intervention.

Thank you.

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*Statistics and the Reserve Bank: Recent Developments and Perspective**

Deepak Mohanty

Deputy Governor, Dr. Urjit R. Patel, Shri A. B. Chakraborty, Officer-in-Charge, Department of Statistics and Information Management (DSIM); heads of select central office departments; distinguished statisticians and economists from the academia; and friends. I extend a warm welcome to you all to the Annual Statistics Conference 2013, organised by DSIM. This conference provides a platform to the officers of DSIM to present their research work before the experts and receive their feedback in order to make the analysis more meaningful for policy and research. I thank the distinguished professors who have consented to discuss various papers prepared by my colleagues in DSIM: Prof. Manoj Panda (Director, Institute of Economic Growth, Delhi), Prof. N. R. Bhanumurthy (NIPFP, New Delhi), Prof. Tathagata Bandyopadhya (IIM, Ahmedabad), Prof. Rajendra Vaidya (IGIDR, Mumbai), Prof. Chetan Ghate (ISI/ICRIER Delhi), Prof. Pulak Ghosh (IIM, Bangalore) and Prof. T. V. Ramanathan (Pune University). You all bring together plenty of expertise and experience in the field of theory and practice of statistical research for economic policy making which is of great value to us.

2. I have said it earlier that Statistics is a public good. As a central bank, we are responsible for generating various macro-financial statistics collected both from primary and secondary sources in the process of implementing our policies. We use statistics and statistical tools extensively to aid informed policy making. Therefore, a solid statistical grounding and soiling the hands with data are basic prerequisites for the making of a good empirical economist. This is evident from the presence of many eminent economists amongst us in this conference.

3. Let me recapitulate briefly about the outcome of the 2012 conference in the context of major developments that took place in the statistical activities during last one year. In the last year's conference, DSIM researchers presented 12 technical papers. Subsequently these papers were revised based on the feedback received from the external experts. I am happy to note that 5 papers have been already submitted for publication in RBI Working Paper Series/RBI Occasional Papers/outside journals and others are in various stages of completion.

4. The research activities of the Department encompass measurement of economic indicators, analysis, modelling and forecasting of economic growth, inflation, corporate performance and capturing economic agents' response to expected macro developments for forward looking monetary policy formulation. Based on various univariate and multivariate models, projected path of growth and inflation is presented in the form of fan charts. In the current economic scenario, the analysis of growth-inflation trade-off, exchange rate pass-through and inflation persistence carried out by the Department was particularly useful for calibrating monetary policy actions.

5. Last year, the conference outlined several data and dissemination initiatives for better harmonisation and synergy between data producers and users. I am happy to note that the department has released a new user friendly interface of Database on Indian Economy (DBIE) and has transformed data warehouse utilities into a major production tool of the Bank. All the major statistical publications of the Bank, as well as all the tables of RBI Bulletin and Weekly Statistical Supplement (WSS), are now generated directly from DBIE.

6. The previous conference also emphasised the need for initiatives for improving banking data with regard

* Opening Remarks by Shri Deepak Mohanty, Executive Director, at Annual Statistics Conference 2013 of the Reserve Bank of India on March 22, 2013 at Mumbai.

to quality, coverage, presentation and dissemination. It was deliberated that data quality and coverage issues require a collaborative effort across the various regulatory, research as also policy departments so as to harmonise the reporting of data. In this connection, the Department had several rounds of interactions during the year with RPCD and DBS to address these issues and resolve the same. Regarding harmonising the reporting of deposits and credit data at granular level, action has been initiated for codification of the input data structure at the data processing and reporting systems of banks as per the classification and coding system followed for the BSR system. The main objective is to source all these data from the banks' CBS platforms so that data reported by the banks to various departments of the Reserve Bank become consistent with the granular databases maintained by the banks. In order to take these initiatives forward, this conference has two structured panel discussions with participation of the stakeholder departments of the Bank. The outcome of the discussion today and tomorrow is expected to pave the way for availability of quality banking statistics.

7. On the operational front, the department conducted a survey on demand and usage of coins across 12 centres, prepared a research paper on estimating counterfeit notes in circulation, and provided statistical basis of estimation of agency commission of commercial banks undertaking government business.

8. The surveys conducted by the department particularly on macroeconomic changes continue to provide valuable inputs for forward looking monetary policy formulation. These include Industrial Outlook Survey (IOS), Order Books, Inventories and Capacity Utilisation Survey (OBICUS), Credit Conditions Survey (CrCS), Inflation Expectations Survey of Households (IESH), Consumer Confidence Survey (CCS) and Survey of Professional Forecasters (SPF). Key findings of most of these surveys are now published on the RBI website simultaneously with the Macroeconomic and Monetary Developments every quarter. This has increased visibility of our survey output and has improved considerably the timeliness in dissemination of survey results. However, this has also increased our accountability of research outputs and responsibility of maintaining good quality statistics. Technical skills of our survey data analysis is now implicitly under public scrutiny.

9. For guidance on technical issues related to surveys, a high level Technical Advisory Committee on Survey (TACS) has been constituted. During the year, coverage of IESH survey has been extended to four more centres covering a total of 16 important centres. Pilot Survey on Employment of Fresh Graduates from Technical Institutions was conducted during June-August, 2012 to collect placement data for 2010-2011 and 2011-2012 from 61 engineering and management institutes to assess trends in employment opportunities of fresh graduates. House price index compilation has been extended to 4 more cities, covering now total 10 cities. Further, in order to complement this, the Department has successfully introduced an Asset Price Monitoring System (APMS) based on housing loan account information available with banks.

10. A dynamic database called 'Branch Locator' was released in the Bank's website providing detailed information (like location, type of business) on branches of commercial banks. This has helped banks in accessing locational information for branch expansion and financial inclusion. Scope of BSR-4 survey, one of the key RBI survey tailored for estimating household savings in the form of bank deposits, hitherto conducted on a sample basis, has been widened to a census from March 2012. The scope of BSR -7 was also expanded to collect data on deposits by type (current, savings and term) from March 2012 quarter. A Standing Monitoring Group has been constituted to implement enhancements to IBS as recommended by the BIS Committee on the Global Financial System (CGFS).

11. In India, analysis of monetary policy transmission was constrained due to absence of effective lending

rate data of banks. In this context, in a research paper, the Department provided a comparable annual time series data on weighted average lending rates (WALR) for bank credit for major sectors in India for the period 1992-2010 based on the comprehensive account level BSR database. This information bridged an important data gap for empirical assessment of the bank lending rate channel of monetary transmission.

12. In the current macroeconomic scenario, the issue of wage price spiral and inflation has resurfaced and has been a topic in public discourse. In this context, the Department compiled a long time series data on rural wage rate based on the data contained in the Labour Bureau Journal for 18 occupations for all the major states as well as at all India level. This is a monthly data base starting from July 1995 to November 2012 (latest) and is available to the public in a user-friendly format in the data warehouse.

13. Regional market intelligence or statistical intelligence plays a pivotal role in providing important inputs to monetary policy and many central banks have established statistical system for gathering regional information. With its reorganised structure and wider presence of regional offices in major centres, the Department has put in place a similar system of gathering relevant statistics and market intelligence, particularly in the area of prices of essential commodities. This system is potentially useful to gauge an early signal of price pressure across commodities before the official data release. Also this data is useful in validating the price trends as available in official price indices like WPI and CPI.

14. The reporting of purpose code under Foreign Exchange Transactions Electronic Reporting System (FET-ERS) was extended to all foreign exchange transactions, including small receipt transactions, on a census basis from April 1, 2012, as suggested by the Central Board. The resultant transition helped India to become one among the pioneer countries to implement BPM6 standards for BoP reporting. Information on International Investment Position, Co-ordinated Direct Investment Survey (CDIS), Co-ordinated Portfolio Investment Survey (CPIS) (for Mutual Funds, Insurance and Private Corporate Sector) are dissemination as a part of the commitment in adherence to the SDDS framework of IMF and G-20 data gaps initiatives.

15. The XBRL project under the High Level Steering Committee (Chairman: Shri Anand Sinha, Deputy Governor) on standardisation in reporting of financial data has made considerable progress during the year. The second phase of this project has been taken up covering 43 returns (22 OSMOS returns, 16 external sector returns of FED and DSIM and 5 returns of UBD). XBRL reporting is being integrated with the data warehouse and will be the only platform for receiving and validating all the incoming data in due course.

16. Central banking today is more challenging than ever and availability of reliable and timely information is the key to effective policy making. The statisticians in the Reserve Bank perform a multifarious role. While the Department has many achievements in the past, let me share a few challenges for the Department going forward.

First, data gaps are an inevitable consequence of the ongoing development of markets and institutions. As has been true of previous international financial crises, these gaps are highlighted when a lack of timely, accurate information hinders the ability of policy makers and market participants to develop effective responses. Indeed, the recent crisis has reaffirmed an old lesson – good data and good analysis are the lifeblood of effective surveillance and policy responses at both the national and international levels. In this context, G-20 data gaps initiatives have provided a statistical framework across nations which are consistent and comparable. DSIM, being the nodal Department in the Bank, has a major role in taking this initiative forward.

Second, there are some surveys on macroeconomic changes which merit further thrust. We have made a beginning on collection of data on employment

opportunities of fresh graduates. We need to have better understanding of the potential demand pressure in the economy. In this context, an important indicator which provides early signs of overall economic activity is retail sales. Many central banks are effectively using the retail sales data. A quarterly survey on retail sales across cities may be initiated with the help of regional offices.

Third, while the Department has developed the database on rural wage rate, there is an urgent need to understand the wage price development in the urban sector. Towards this, quarterly corporate results could be suitably examined in order to provide time series data of urban wage.

Fourth, the Department is involved in various data gap and statistical measurement issues through its participation in various committees within and outside the RBI. One particular issue that has received renewed attention recently is the development of a Producers Price Index (PPI), including services. While this is presumably an institutional effort being made by the Government, work relating to a statistical framework of PPI in Indian context could be attempted by the Department.

Fifth, during last 5 years or so, statistical systems both for financial and banking, have undergone a major change. New systems are introduced in line with global standard of data compilation and dissemination. In this context, efforts should be made to update the 'Manual on Banking and Financial Statistics', which was published last in 2007.

Sixth, while the Department has made considerable inroads towards collection of forward looking information for monetary policy formulation, our effort on financial inclusion surveys has been limited. Financial inclusion is policy priority of the Bank. Therefore, it is necessary for the Department to engage itself in formulation and undertaking of surveys on financial inclusion, particularly assessment of financial inclusion outcomes in the villages following the outreach programme of the Bank, in collaboration with RPCD and its regional offices.

Seventh, the Department has noticeable presence in a number of central office departments, like Monetary Policy Department (MPD), Department of External Investment and Operations (DEIO), Internal Debt Management Department (IDMD), Department of Information Technology (DIT), Department of Payment and Settlement Systems (DPSS), Department of Banking Supervision (DBS) and Financial Stability Unit (FSU). It is desirable that our officers in these departments provide analytical inputs for policy and operational issues and come out with research papers. These papers could be presented in conferences and published eventually in the RBI Working Paper Series. This will make research more valuable in furthering our organisational objectives.

Eighth, focused and determined approach to research across various units, including the regional offices, should be pursued so that research agenda being adopted by the Department is accomplished in a timely manner. For data management and dissemination, technology must be harnessed to its fullest extent. There is also a need to strengthen the modelling and forecasting capabilities towards developing a full fledged forecasting suite including DSGE models.

17. Finally, I conclude with a quote from the famous statistician John Tukey: '*The best thing about being a statistician is that you get to play in everyone's backyard.*' I see limitless opportunities for a statistician as the demand for statistical skills and statistics in the Bank keeps growing as we grapple with many questions. I hope the deliberations of this conference will bring academics and policy makers closer and lead to strengthening our statistical analysis and system. I wish the conference all success.

18. Thank you.

Efficacy of Monetary Policy Rules in India *

Deepak Mohanty

I thank Professor Pami Dua for the opportunity to interact with this distinguished gathering of professors and young scholars. The Delhi School of Economics has a formidable reputation world over in teaching and research in economics. I will be speaking on the subject of monetary policy rules, not only because it relates to my area of work, but it offers considerable scope for research.

My scheme of presentation is as follows. First, I begin by giving you a snapshot of the evolution of monetary framework in India to contextualise how short-term interest rate has emerged as the key operating objective of monetary policy. Second, I briefly focus on the debate on rule *versus* discretion in the conduct of monetary policy. Third, I present simple Taylor rule estimates for India covering the recent period of 2001-2013 reflecting greater use of interest rate as an instrument of monetary policy. I will conclude with some thoughts on the way forward.

Monetary policy operations

Let me briefly highlight the evolution of monetary policy operating framework in India, to place our discussion on interest rate rules in perspective. In India, as in most countries, monetary policy framework has evolved in response to and as a consequence of financial developments, openness and shifts in the underlying transmission mechanism. The evolution of monetary policy framework in India can be seen in phases. In the formative years during 1935–1950, the focus of monetary policy was to regulate the supply of and demand for credit in the economy through the bank rate, reserve requirements and open market operations (OMO). In the development phase during 1951–1970, monetary policy was geared towards supporting plan financing. This led to introduction of several quantitative control measures to contain consequent inflationary pressures. While ensuring credit to preferred sectors, the bank rate was often used as a monetary policy instrument. During 1971–90, the focus of monetary policy was on credit planning. Both the statutory liquidity ratio (SLR) and the cash reserve ratio (CRR) were used to balance government financing and the attendant inflationary pressure.

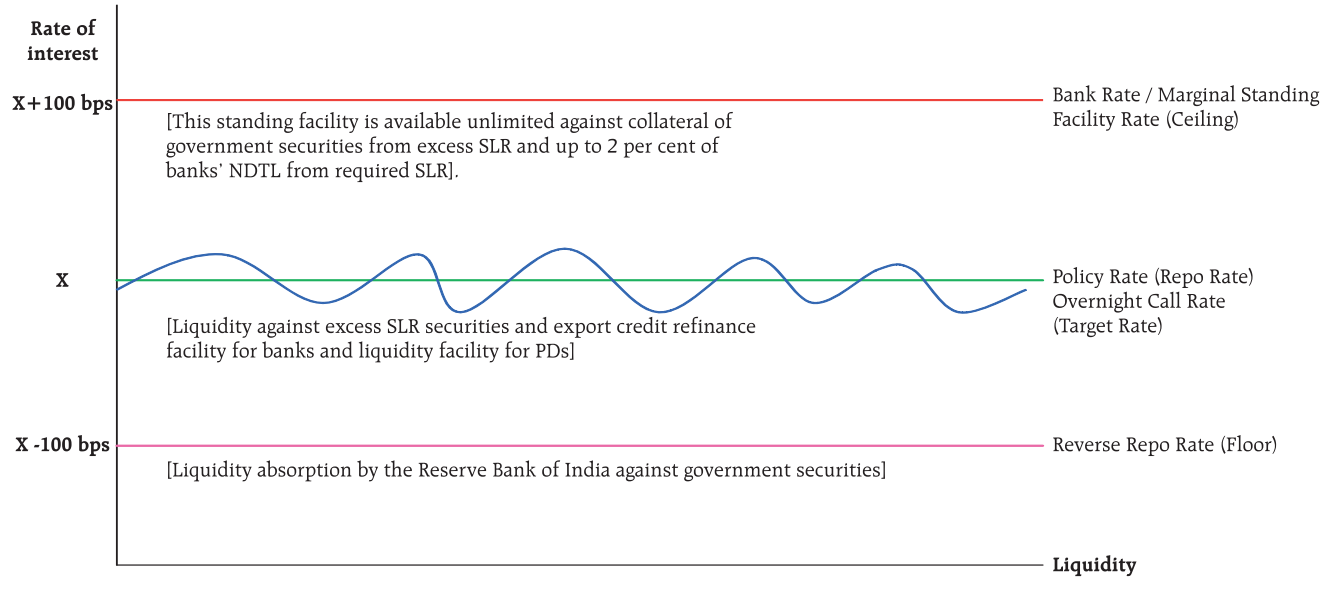
Subsequently, structural reforms and financial liberalisation in the 1990s shifted the financing paradigm for the government and commercial sectors with increasingly market-determined interest rates and exchange rate. By the second half of the 1990s, in its liquidity management operations, the Reserve Bank was able to move away from direct instruments to indirect market-based instruments. Starting in June 2000, the Reserve Bank introduced a full-fledged liquidity adjustment facility (LAF). It was operated through overnight fixed rate repo and reverse repo in November 2004. This process helped to develop interest rate as an instrument of monetary transmission. This framework was reinforced in May 2011 when the weighted average overnight call money rate was explicitly recognised as the operating target of monetary policy and the repo rate was made the only one independently varying policy rate (Mohanty, 2011)[1].

The new operating framework illustrated in Chart 1 with the modified LAF assigns a greater weight to the interest rate channel of monetary transmission. This means that once the Reserve Bank changes policy repo rate, it should quickly impact the overnight interest rate which is the operational rate and then transmit

* Speech by Shri Deepak Mohanty, Executive Director, Reserve Bank of India at Delhi School of Economics, Delhi, March 25, 2013. The assistance provided by Dr. Abhiman Das and Shri Binod Bhoi in preparation of this speech is acknowledged.

1 Mohanty, Deepak (2011): "How does the Reserve Bank of India conduct its Monetary Policy?" *Reserve Bank of India Bulletin*, September.

Chart 1: The new LAF framework is based on explicit interest rate targeting

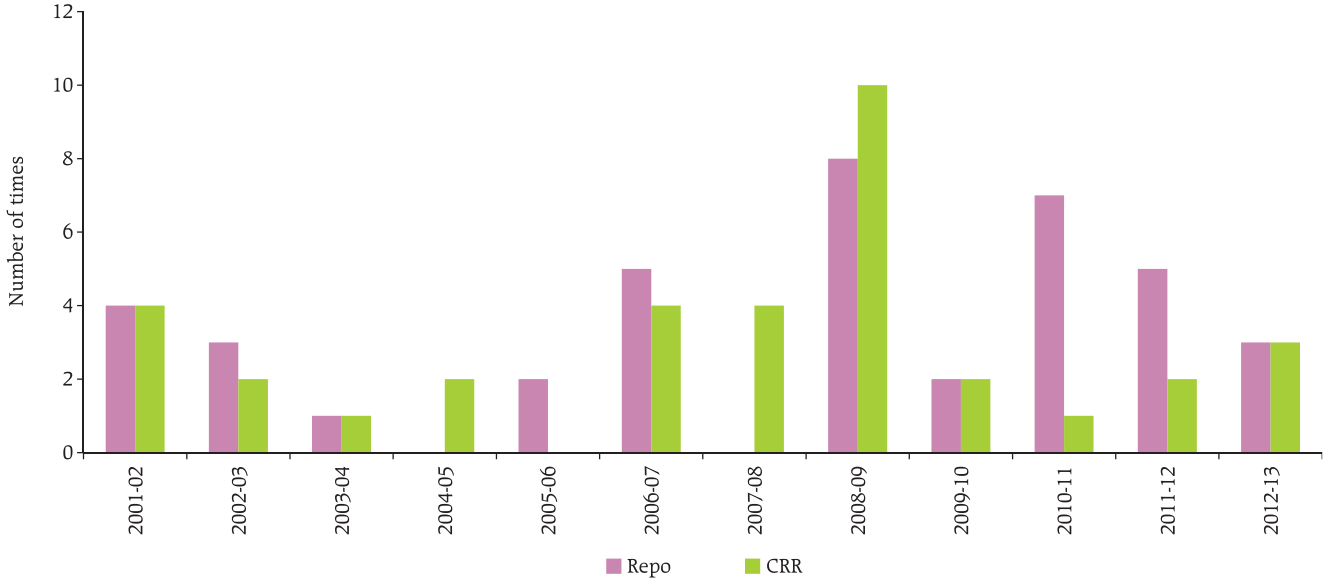


through the term structure of interest rates as well as bank lending rates. Increasing importance of this channel was also evident from the mix of instruments of policy actions. Over the years, in comparison with CRR, the use of interest rate instruments such as the Repo rate by the Reserve Bank has been more frequent, except for the year 2008-09, which was the peak of the global financial crisis (Chart 2).

Rule *versus* discretion

As the Reserve Bank has started explicitly targeting overnight interest rate as the operational objective with the instrument of policy repo rate, there are relevant questions that arise: How that interest rate should be determined? Should it broadly follow a rule or should it be based on the central bank's discretion? The debate about rule *versus* discretion is as old as monetary

Chart 2: In the recent years frequency of policy interest rate changes has increased



economics. This issue received added impetus as the monetary system transited from gold standard to fiat money. When Kydland and Prescott (1977) in their seminal article presented the time inconsistency argument in favour of rules, the debate became even sharper[2]. Subsequently, Taylor (1993) demonstrated how even in the practical world of monetary policy making, the monetary policy reaction function could be modeled as predetermined rules with superior policy outcome[3]. Let me briefly touch upon the pros and cons of rule-based monetary policy before turning to the formulation of Taylor rule.

A number of reasons have been advanced in the literature as to why rule-based monetary policy could be more effective. First, a rule towards a credible commitment by the central bank to maintain price stability can reduce the inflation bias from monetary policy. Second, rules enhance economic efficiency by reducing uncertainty about future policy. Third, rules help policymakers avoid pressures from special interest groups and facilitate action consistent with long-run goals. Fourth, rules facilitate communication, promote transparency and increase accountability.

Similarly, there are arguments against application of rules. First, the economic system is too complex to be characterised by any rule. Second, the same rule may not work over the business cycle. Third, rule-based policy reduces the flexibility to respond to exogenous shocks. Fourth, rules do not allow for policy surprises which may be desirable for policy effectiveness under certain circumstances. Fifth, rules are ill suited to developing economies characterised by underdeveloped financial markets and rapid structural transformation.

In practice, it is difficult to come across central banks, which explicitly spell out their policy rules. However, for modern central banks, empirical assessments and policy evaluations are increasingly based on rules ever since Taylor's influential paper. In empirical work, original Taylor rule is modified and extended in a variety of ways for adapting to specific country set up and evolving monetary framework. These include forward-looking Taylor rule, Taylor-McCallum type rule, non-linear framework for addressing asymmetric behavior of monetary policy and time-varying nature of its parameters.

Taylor rule

Taylor rule is an interest rate feedback rule for a central bank for setting short-term interest rates to achieve both its objectives of stabilising the economy and achieving price stability as economic conditions fluctuate. This could be expressed as:

$$i_t^* = r_t^* + \pi_t + \beta(\pi_t - \pi_t^*) + \gamma(y_t - y_t^*) \quad \ldots\ldots\ldots (1)$$

Where, i_t^* = short-term (target) nominal interest rate, π_t = rate of inflation, π_t^* = desired rate of inflation, r_t^* = real (equilibrium) interest rate, y_t = real GDP growth rate and y_t^* = potential real GDP growth rate. From the Taylor rule specification, one can define 'neutral' rate of interest i_t^* as the short-term interest rate for which the economy is growing at its potential level and inflation is at its desired level. Hence, 'neutral' rate of interest $i_t^* = r_t^* + \pi_t^*$.

The rule recommends that short-term interest rate should be changed according to the deviation of inflation from its predetermined target and output from its potential level. Essentially, the combination of inflation and output gap should determine what should be the appropriate policy rate that would return the economy to its potential level without causing inflation. If these goals are in conflict in the sense that inflation is above its target and the economy is growing below its potential or *vice versa*, the rule provides guidance

2 Kydland, Finn and E. Prescott (1977): "Rules Rather than Discretion: The Inconsistency of Optimal Plans", *Journal of Political Economy*, 85 (3), 473-492.

3 Taylor, J.B. (1993): "Discretion versus policy rules in practice", *Carnegie-Rochester Conference Series on Public Policy*, 39, 195–214.

on how to balance these competing considerations in setting an appropriate level for the policy interest rate.

While β and γ could be estimated from data, Taylor assumed those as 0.5 each. In a sense it assigns equal weight to both inflation and growth objectives. This is a reasonable assumption considering that most central banks are concerned both with inflation and growth. These dual objectives are built into many central bank statutes, including that of the US in a way. He also additionally assumed that desired level of inflation for the US was 2 per cent per annum and the equilibrium real policy rate was 2 per cent per annum. Taylor (1993) showed that a simple monetary policy rule, where the US Fed raises the interest rate if inflation rate exceeds a 2 per cent implicit target or if real GDP growth is higher than its potential, describes quite well the actual path of the Fed funds rate between 1987 and 1992.

The linear framework of Taylor rule is, however, criticised by many on the ground that central banks have asymmetric preferences for interest rate smoothing depending on the direction of their monetary policy stance. In addition to changes between discretionary and rule-based policy regimes, economic theory provides several reasons for deviating sometimes from a symmetric and linear policy rule framework (Gerlach, 2000).[4] An accepted way of representing such behaviour in literature is to assume that actual interest rate i_t gradually adjusts to the desired rate as: $\acute{i}_t = \rho i_{t-1} + (1-\rho)\ \acute{i}_t^*$, where $0 \leq \rho \leq 1$ captures the observed smoothing of the policy rate by the central bank, *i.e.*, the smoothing parameter. Substituting this in the original Taylor rule formulation in (1), the modified Taylor rule with smoothing takes the form as:

$$\acute{i}_t = \rho i_{t-1} + (1-\rho)[\alpha + \beta(\pi_t - \pi_t^*) + \gamma(y_t - y_t^*)] \ldots (2)$$

It may be noted that equation (2) is not linear in parameters and hence parameters ρ, α, β and γ are estimated from the observed data by non-linear least square method.

Estimates for India

In India there has not been much research on monetary policy rules partly because the underlying monetary framework largely relied on direct and quantity based instruments. Moreover, the commercial interest rate structure was highly regulated till recently. In the Indian context, Singh (2010) estimated Taylor rule using annual data for the period 1950-2009 and observed a shift in policy response towards inflation gap since the 1990s.[5] Patra and Kapur (2012) estimated a forward-looking exchange rate augmented Taylor rule and found a high degree of interest rate smoothing.[6]

Empirical estimation of Taylor rule will require a priori determination of three parameters: the desired level of inflation, potential output and equilibrium real policy rate. These parameters are country-specific, and hence need to be estimated.

First, in the mid-1980s the Chakravarty Committee (1985)[7] had suggested a tolerable level of inflation of 4.0 per cent per annum to facilitate changes in relative prices necessary to attract resources to growth sectors. The Reserve Bank's current assessment suggests that the threshold level of inflation for India is in the range of 4.4-5.7 per cent, implying a mid-point rate of 5.0 per cent (Subbarao, 2013).[8] Drawing on the research in the Reserve Bank, the desired level of inflation rate in terms of year-on-year variation in the wholesale price index

4 Gerlach, S., (2000): "Asymmetric Policy Reactions and Inflation", *Working Paper*, Bank for International Settlements.

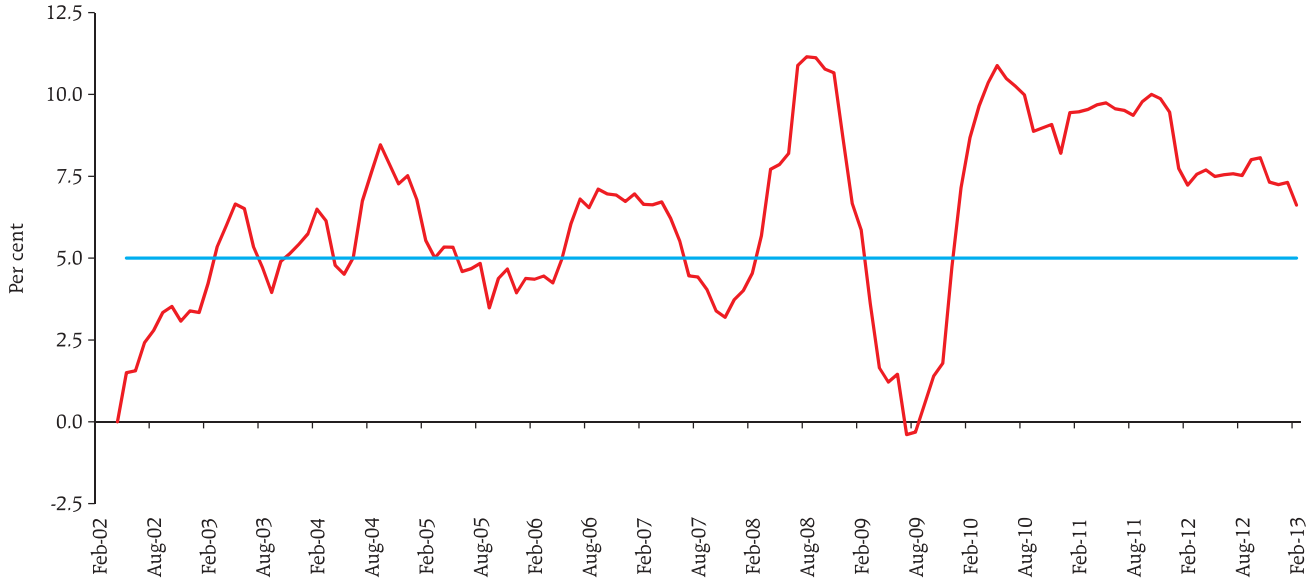
5 Singh, Bhupal (2010): "Monetary Policy behaviour in India: Evidence from Taylor-Type Policy Frameworks", Reserve Bank of India, *Staff Study*, SS (DEAP): 2/2010.

6 Patra, M. D. and M. Kapur (2012): "Alternative Monetary Policy Rules for India", *IMF Working Paper*, No.118, IMF.

7 Reserve Bank of India (1985): *Report of the Committee to Review the Working of the Monetary System (Chairman: Sukhamoy Chakravarty).*

8 Subbarao, D (2013): "Is There a New Normal for Inflation?" Speech delivered at the Bankers' Club, New Delhi on March 8, 2013.

Chart 3: Inflation in the post-crisis period has remained above the desired rate



(WPI) is assumed at 5.0 per cent. The actual inflation rate, however, has remained above this threshold level in the post-crisis period (Chart 3).

Second, the potential output growth can be estimated by using the Hodrick-Prescott (HP) filter. The estimated potential output is broadly comparable to the Reserve Bank's assessment that India's potential output may have dropped from 8.5 per cent during the high growth phase of 2003-08 to 8.0 per cent in the post-crisis period to around 7.0 per cent in 2012-13 (Chart 4).

Third, the determination of the neutral real policy rate is a complex issue as it is not observed in real time. One way is to derive it from a comprehensive general equilibrium model of the Indian economy. Another simpler, though not very satisfactory, way of deriving it is from the Taylor rule estimate itself. The empirical estimate from the two alternatives of Taylor rule estimated by us suggests it to be in the range of 0.5-0.9 per cent covering a longer period from 2000-01:Q_1 to 2012-13:Q_3 which encompassed the recent bout of high inflation. The implicitly derived number from the high growth and low inflation phase of 2003-08 works out to 1.1 per cent per annum (Table 1). For the purpose of this exercise we have assumed it to be 1 per cent. Combined with our first assumption of desired level of inflation of 5.0 per cent, it will imply that the neutral nominal policy rate could be assumed around 6.0 per cent per annum.

Chart 4: Potential output is estimated to have moderated in the post-crisis period

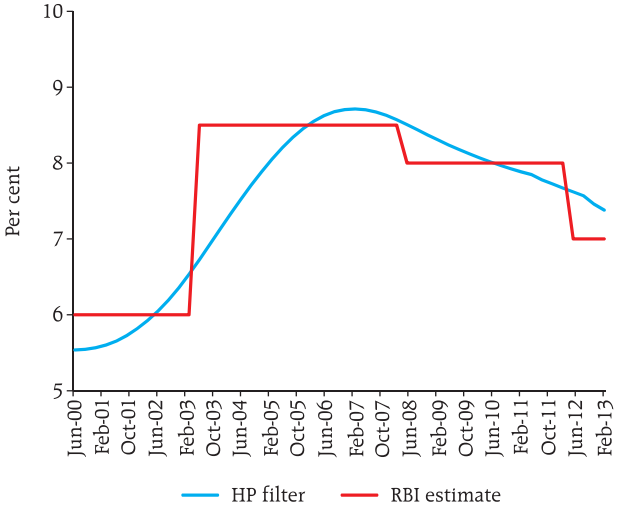


Table 1: While growth moderated inflation remained high in the post-crisis period

(Per cent)

Indicators	2003-08 average	2008-09	2009-10	2010-11	2011-12	2012-13	2008-13 average
GDP Growth	8.6 (1.1)	6.7	8.6	9.3	6.2	5.0*	7.0 (1.8)
WPI Inflation	5.6 (1.0)	8.1	3.8	9.6	8.9	7.4^	7.2 (2.2)
Repo Rate	6.7 (0.7)	7.4	4.8	5.9	8.1	7.9	6.7 (1.4)
Real Repo Rate	1.1 (1.3)	-0.7	1.0	-3.6	-0.8	0.5	-0.5 (1.8)

*Advance Estimates.
^Apr-Feb. Figures in brackets are standard deviations.

Following these three key assumptions, empirical analysis is done in two stages. In the first stage, we have estimated the Taylor rule from the observed data with and without interest rate smoothing. In the second stage, we have simply used the original Taylor rule assuming inflation and output gap coefficients at 0.5 each. Our empirical analysis is based on quarterly observations from 2000-01:Q_1 to 2012-13:Q_3 with average overnight call money rate as the measure of short-term interest rate. The results suggest greater weight on inflation, evident from the level of statistical significance and correctness of the sign of the parameters, in the standard formulation. But interest smoothing becomes dominant in the alternative formulation alongside a significant weight on inflation. In this formulation, although the output gap has the expected sign, it turns out to be statistically insignificant. However, the explanatory power of the equation improves substantially as compared with the standard formulation (Table 2).

Given the estimated neutral rate of interest, desirable inflation rate and potential output growth, we have calculated the level of interest rate implied by the standard Taylor rule with equal weight of 0.5 to both inflation and output gap. The trend in estimated interest rate implied by Taylor rule showed periods of significant departure from the actual call money rate trajectory. But the deviation was more pronounced in the post crisis period which has since narrowed in 2012-13. Interestingly, there was close correspondence between the implied Taylor rule interest rate and actual overnight call money interest rates during the high growth phase of 2003-08 (Chart 5).

We also compare another measure of gap: interest rate gap as the difference between quarterly average overnight call rate and interest rate obtained from the Taylor rule, and inflation gap as the difference between quarterly average inflation rate and target inflation (Chart 6). It showed statistically significant inverse correlation which implies that higher the deviation of policy rate from that implied by the simple Taylor rule, higher is the deviation of inflation from its desired level.[9]

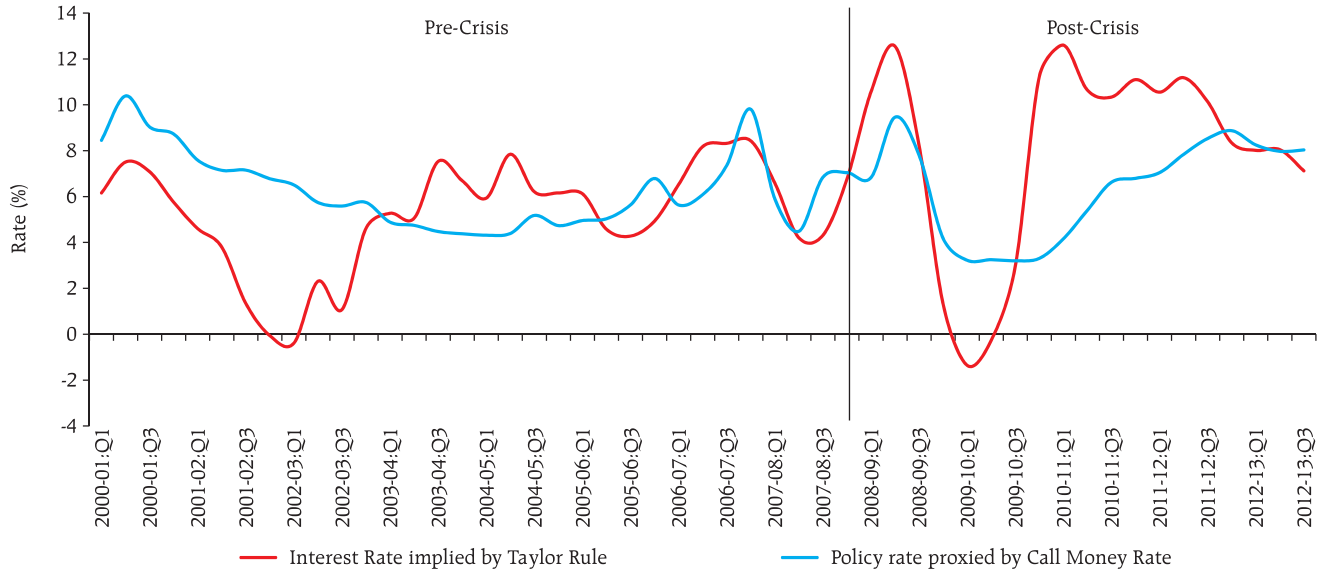
Table 2: Parameter estimates of Taylor rule

Equation	ρ	α	r*	β	γ	R^2
1. Estimated Standard Taylor rule	--	4.68 (0.00)	0.93	0.25 (0.02)	-0.26 (0.05)	0.21
2. Estimated Taylor rule with smoothing	0.75 (0.00)	1.92 (0.34)	0.52	0.72 (0.06)	0.23 (0.67)	0.66

Assumptions:
(i) Period of observations: Q1:2000-01 to Q3:2012-13.
(ii) Desired inflation rate (π^*) = 5%.
(iii) Potential output estimated by HP filter.
(iv) $r^* = \alpha + (\beta\text{-}1)\ \pi_t^*$ for given values of desired level of inflation at π_t^*.
Note: Figures in bracket indicate p-values.

9 Correlation coefficient of -0.78 which was statistically significant at 1 per cent.

Chart 5: Greater divergence in interest rate post-crisis

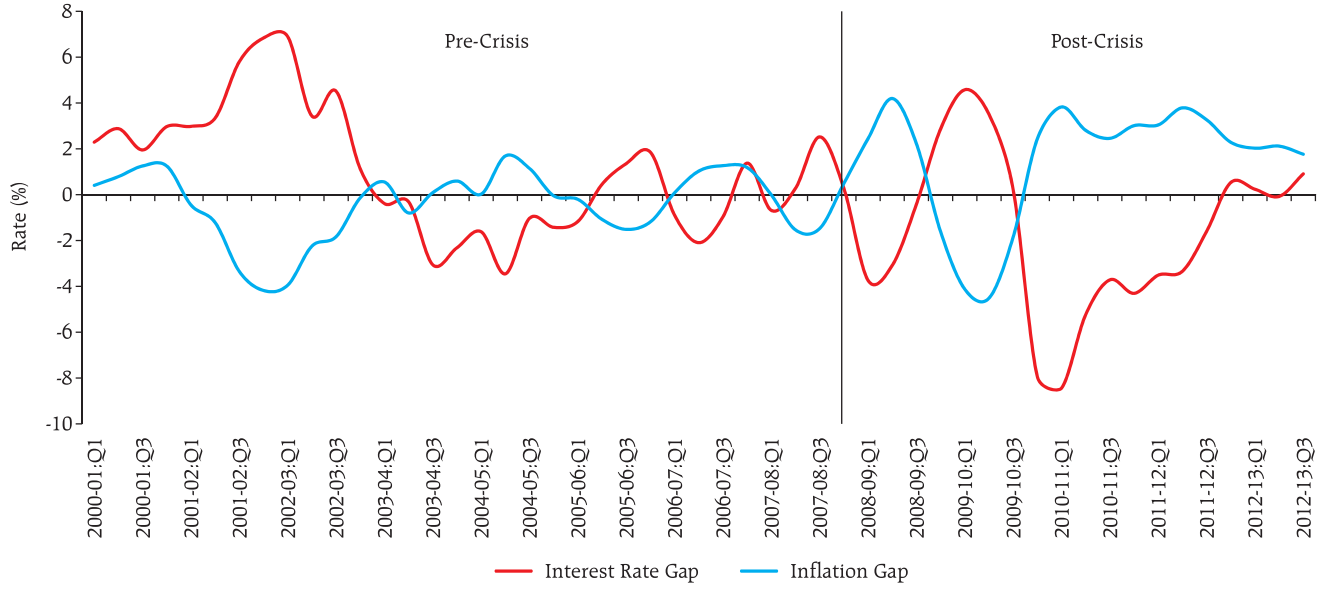


Moreover, in the crisis period, the gap had widened which has since narrowed in 2012-13. Additional diagnostics suggested bi-directional causality between the interest rate gap and inflation gap. It is noteworthy that this gap was narrower during the high growth phase of 2003-08.

Conclusion

Let me conclude. The Taylor rule has been extensively used to understand the interest rate setting behaviour of central banks across the world. Recent empirical work including the simple characterisation I have presented here suggests that a Taylor-type rule

Chart 6: Interest rate gap mirrored inflation gap



could be a useful additional tool in understanding the interrelationship among growth, inflation and policy interest rate as the interest rate channel of monetary transmission strengthens. At the same time, it should be emphasised that Taylor rule has its limitations as exclusive emphasis on interest rates with the neglect of other variables may not be optimal for an emerging market economy like India. In my presentation if I have raised more questions than provide answers, I would have succeeded in my intention. There is a need for further research to enhance our understanding of appropriate interest rate structure which is conducive to price stability in the medium- to long-term.

Thank you.

ARTICLE

India's Foreign Trade: 2012-13
(April - December)

North-East Monsoon 2012: An Overview
(October - December)

Investment Portfolio of Scheduled Commercial Banks:
March 2012

India's Foreign Trade: 2012-13 (April-December) *

This article reviews India's merchandise trade performance during April-December 2012-13 on the basis of the data released by the Directorate General of Commercial Intelligence and Statistics (DGCI&S). It also analyses disaggregated commodity-wise and direction-wise details during this period.

Highlights

India's trade performance during 2012-13 (upto December 2012) continued to be weak as the trade deficit increased to US$ 147.2 billion reflecting substantial contraction in merchandise exports as compared to imports. The deterioration in export performance was evident across far more commodity groups as well as export destinations in H1 of 2012-13 as concerns regarding global slowdown escalated further during the period. Contraction in exports of manufactured goods, contributing around 64 per cent of total merchandise exports significantly impacted India's export performance. Of which, labour intensive sectors like handicrafts, textiles and gems & jewellery witnessed significant decline. Recovery in the trade sector is largely contingent upon the revival of global demand. As per latest projections by the IMF, global trade volume is expected to grow by 3.8 per cent in 2013 as against 2.8 per cent in 2012. Major highlights of India's trade performance during the period of April-December 2012-13 are given below:

- The export figures during April-December 2012 stood at US$ 214.1 billion with a decline of 5.5 per cent as compared to a growth of 29.6 per cent during April-December 2011.
- Imports during this period at a level of US$ 361.3 billion registered a decline of 0.7 per cent as against an increase of 35.2 per cent in April-December 2011.
- The decline in imports was mainly on account of the fall in gold and non-oil non-gold imports. Import of petroleum, oil and lubricants (POL) continued to rise, notwithstanding a decline in international prices of crude oil (Indian basket).
- The greater fall in exports compared to that of imports resulted in a trade deficit of US$147.2 billion during April-December 2012. Of which, the POL sector contributed the most with a deficit of US$ 85.4 billion.
- The disaggregated data for merchandise exports of commodities during H1 of 2012-13 show that decline in exports was largely on account of reversal of growth momentum in case of exports of petroleum products and engineering goods.
- Exports to EU countries have been severely impacted due to sluggish demand, particularly in Germany, Italy, UK and Belgium. Reflecting adverse spillovers from advanced economies to other economies, India's exports to most emerging market and developing economies (EMDEs) either declined or showed decelerated growth during H1 of 2012-13 as compared with corresponding period of 2011-12.

I. India's Merchandise Trade

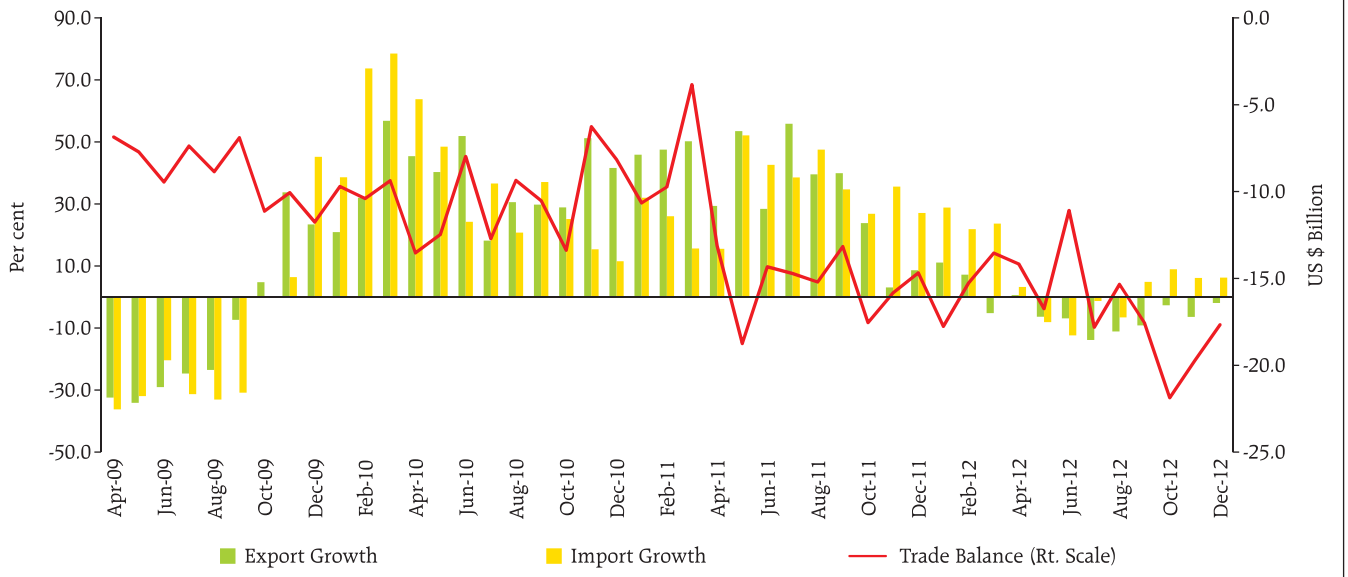
Exports (April-December 2012)

Although export performance continued to be weak during this period, decline in exports in Q3 of 2012-13 was relatively less pronounced than that in H1 of 2012-13, perhaps reflecting the impact of export promotional measures undertaken by the Government in June 2012 (Chart 1). Lingering global uncertainties and weakness in advanced and EMDEs, however, continued to weigh on India's external demand.

Exports during April-December 2012 stood at US$ 214.1 billion with a decline of 5.5 per cent as against

* Prepared in the Division of International Trade and Finance, Department of Economic and Policy Research. The previous issue of the article was published in the Reserve Bank Bulletin, December 2012.

Chart 1: India's Merchandise Trade



US$ 226.6 billion in April-December 2011 with an increase of 29.6 per cent (Table1).

Table 1: India's Merchandise Trade

(US$ billion)

Items	April–December	
	2011-12 R	2012-13P
1	2	3
Exports	226.6	214.4
	(29.6)	(-5.5)
Of which: Oil	42.3	40.0
	(49.5)	(-5.4)
Non-oil	184.3	174.4
	(25.8)	(-5.5)
Gold	5.0	4.7
	(31.6)	(-6.0)
Non-Oil Non-Gold	179.3	169.7
	(25.6)	(-5.5)
Imports	363.9	361.3
	(35.2)	(-0.7)
Of which : Oil	111.0	125.4
	(47.6)	(13.0)
Non-oil	252.9	235.9
	(30.4)	(-6.7)
Gold	41.7	37.8
	(46.3)	(-9.4)
Non-Oil Non-Gold	211.2	198.1
	(27.6)	(-6.2)
Trade Deficit	-137.3	-147.2
Of which: Oil	-68.7	-85.4
Non-oil	-68.6	-61.8
Non-Oil Non-Gold	-31.9	-28.7

Note: Figures in brackets represent growth rate.
Source: DGCI&S.

Commodity-wise and Destination-wise Exports (April-September 2012-13)

Disaggregated commodity-wise export data show that decline or deceleration in growth that began in H2 of the preceding financial year seem to have gathered momentum in H1 of 2012-13 (Table 2). Major items which moved from positive growth territory in the second half of preceding year to the negative growth territory in the current year include engineering goods, petroleum products, textiles and iron ore. Exports of iron ore continued to show growth deceleration reflecting the persistent impact of poor mining activity, increase in export duty since end-December 2011, increase in freights for iron ore exports and increase in iron ore price by about 8-13 per cent by the state owned miners. Though slower growth has been pervasive across all major sectors, some minor sub-sectors or commodities, however recorded accelerated growth. These mainly include tobacco, wheat, rice, processed minerals, manufacture of metal and carpets which together constitute less than 8 per cent of total exports.

Destination wise data show that exports to countries in the European Union and Asian countries

Table 2: India's Exports of Principal Commodities

(Per cent)

Commodity Group/ Period	Percentage Share			Relative Weighted Variation		
	2011-12	2011-12:H1	2012-13:H1	2011-12: H1	2011-12: H2	2012-13: H1
1	2	3	4	5	6	7
Primary Products	15.0	12.1	16.2	4.8	5.1	3.1
Agriculture and Allied Products	12.2	9.6	14.1	5.4	4.8	3.6
Ores and Minerals	2.8	2.5	2.1	-0.6	0.3	-0.5
Manufactured Goods	60.6	61.6	62.9	23.1	1.4	-2.7
Of which:						
Leather and Manufactures	1.5	1.6	1.7	0.6	0.2	-0.1
Chemicals and Related Products	12.1	11.7	13.3	4.7	2.1	0.8
Engineering Goods	22.2	23.0	22.3	8.3	0.4	-2.1
Textiles and Textile Products	9.2	9.3	9.1	3.3	0.1	-0.8
Gems and Jewellery	14.7	15.0	15.3	5.8	-1.4	-0.6
Petroleum Products	18.3	19.0	18.7	10.6	2.0	-1.5
Others	6.1	7.3	2.2	2.1	-1.2	-5.3
Total	**100.0**	**100.0**	**100.0**	**40.5**	**7.3**	**-6.4**

Source: Based on DGCI&S data.

has suffered a major setback. While exports to EU, accounting for 16.3 per cent in India's merchandise exports, declined by 11.2 per cent, those to Asian countries, (excluding Japan) with a share of 28.1 per cent, contracted by 8.4 per cent during April-September 2012 (Table 3). Even though India's exports have gradually became more diversified over the years through various policy measures (Box I), the growth deceleration in most of the Asian economies seems to have affected India's exports in H1 of 2012-13. In particular, a significant decline was observed in external demand from export-oriented Asian economies, *viz.*, China, Japan, Singapore, Hong Kong, South Korea and Malaysia. With scaling down of manufacturing activity in these economies, the demand for inputs from India seems to have been affected. Growth in exports to African and Latin American countries was also substantially lower during April-September 2012 as compared with corresponding period of 2011-12.

As shown in Table 4 and Table 5, high growth in exports recorded during H1 of 2011-12 was well diversified across region. As growth concerns evident in advanced economies spread over emerging market and developing economies as well, India's exports began to be impacted since H2 of 2011-12. For instance, the relative weighted contribution of developing Asia to total export growth declined to 4.3 percentage points in H2 of 2011-12 and later turned negative to 2.4

Table 3: India's Exports to Principal Regions

(Percentage Shares)

Region/Country	2010-11	2011-12	2011-12	2012-13
	April-March		April-September	
1	2	3	4	5
I. OECD Countries	**33.2**	**33.8**	**33.2**	**35.3**
EU	18.3	17.2	17.1	16.3
North America	10.6	12.0	11.8	14.4
US	10.1	11.4	11.2	13.7
Asia and Oceania	2.8	3.0	2.6	2.9
Other OECD Countries	1.5	1.6	1.8	1.8
II. OPEC	**21.3**	**19.0**	**18.3**	**21.8**
III. Eastern Europe	**1.1**	**1.1**	1.0	1.3
IV. Developing Countries	**38.2**	**40.8**	**39.3**	**40.8**
Asia	27.9	29.7	28.7	28.1
SAARC	4.6	4.4	3.9	4.7
Other Asian Developing Countries	23.3	25.3	24.7	23.3
People's Republic of China	6.2	6.0	5.2	4.4
Africa	6.3	6.7	6.2	7.7
Latin America	4.0	4.4	4.4	5.1
V. Others / Unspecified	6.2	5.3	8.2	0.8
Total Exports	**100**	**100**	**100**	**100**

Source: Compiled from DGCI&S data.

Box I: Policy Measures to Diversify India's Exports: Destination-wise

In recent years, India has made a distinct shift in terms of country-wise diversification of export. In fact, recognising the changing dynamics of world growth, India's trade policy recognised the need for adopting a market diversification strategy. As a part of the strategic plan, the Government accorded significant priority to market diversification of India's exports and building up a brand image of India. India's strategy towards market diversification emphasises (i) retaining presence in traditional advanced country markets, (ii) move up the value chain in providing products in traditional export markets and (iii) explore opportunities both in terms of markets and products in newly opened up emerging markets.

An inter-temporal comparison of India's destination-wise exports shows that the share of EMDEs in India's total merchandise exports has increased gradually since mid-1990s. Initiated along with the new economic policy in 1991, the Look East Policy seems to have boosted India's trade linkages with South-East Asian countries. Since the liberalisation of the economy, the Government provided a conducive policy environment through a mix of measures including fiscal incentives, institutional changes, procedural rationalisation, and efforts for enhanced market access across the world to boost exports. In 2006, the Government introduced a focus market scheme (FMS) which underscored the strategic necessity of enlarging India's market share in potential market. Under FMS, the Government allows duty credit facility linked to the FOB value of exports of all products to the notified countries. The objective of FMS was to offset the high freight cost and other difficulties faced by exporters entering international markets. Since its inception, the list of countries notified under FMS has been gradually expanded. During 2008-09 to 2011-12, 29 new countries have been included within the ambit of FMS. The scope under other schemes, *viz.*, the Market Linked Focus Product Scheme (MLFPS) has also been expanded. The coverage of FMS, Special FMS and Market-Linked Focus Product Scheme was further broadened in 2012-13 (June 2012 and December 2012).

With increasing policy attention to explore new export markets in EMDEs, the high growth destinations, such as East Asian and South-East Asian economies like China, Singapore and Hong Kong have dominated the India's exports scenario with the third, fourth and fifth positions in recent years. Not only that United Arab Emirates has emerged the top destination for India's exports, exports to other EMDEs, Brazil, Indonesia and Saudi Arabia have also increased significantly over the years.

Table 4 : Growth Performance of Major Trade Partner Economies

(Per cent)

Period	Q1-2011	Q2-2011	Q3-2011	Q4-2011	Q1-2012	Q2-2012	Q3-2012	Q4-2012
Country								
Japan	0.2	-1.7	-0.5	-0.1	3.3	3.9	0.4	0.1
Euro area (17 countries)	2.4	1.6	1.3	0.6	-0.1	-0.5	-0.6	-0.9
United States	1.8	1.9	1.6	2.0	2.4	2.1	2.6	1.5
China	9.4	9.6	9.7	9.1	8.1	7.6	7.4	7.9
Hong Kong	7.8	5.1	4.3	2.8	0.7	1.2	1.3	..
Singapore	9.7	1.6	6.0	3.6	1.5	2.3	0.0	1.5
Korea	4.0	3.5	3.7	3.4	2.9	2.3	1.5	1.6
Indonesia	6.6	6.5	6.6	6.4	6.4	6.3	6.2	6.1
Malaysia	5.0	4.3	5.7	5.2	5.1	5.6	5.2	..
Brazil	4.1	3.3	2.3	1.4	0.7	0.4	1.0	..
South Africa	4.0	3.7	3.2	3.0	2.4	2.8	2.6	..

.. : Not Available.

Note: Growth Rates are seasonally adjusted (except for Hong Kong, Singapore and Malaysia).

Source: OECD, Singstat database, Monthly Statistical Bulletin Bank Negara Malaysia.

percentage points in H1 of 2012-13 (13.1 percentage points in H1 of 2011-12). Similarly, the relative contribution of newly explored markets in Africa and Latin America in India's export growth also recorded a sharp decline in H1 of 2012-13. It implies that India's

Table 5: Region-wise Relative Weighted Variation in India's Export Growth

(Per cent)

	2010-11: H1	2010-11: H2	2011-12: H1	2011-12: H2	2012-13: H1
EU	4.3	6.7	6.2	-0.2	-1.9
North America	3.6	3.1	5.2	3.1	1.7
Other OECD	1.9	1.5	1.5	1.2	0.0
OPEC	5.4	11.8	5.0	-0.8	2.2
Eastern Europe	0.6	0.6	0.3	0.1	0.2
Developing Asia	8.3	10.2	13.1	4.3	-2.4
Africa	2.9	3.2	2.1	1.6	1.0
Latin America	3.4	0.9	1.7	1.0	0.3
Others	5.2	6.6	5.4	-2.7	-7.6
Export Growth	**35.6**	**44.5**	**40.5**	**7.3**	**-6.4**

exports were impacted not only due to fragile economic and financial conditions in traditional markets like the US and the EU but also due to slowdown in relatively new markets in Asia, Africa and Latin America which appear to have been affected more by adverse spillovers from the advanced economies.

Imports (April-December 2012)

Merchandise imports during April-December 2012-13 stood at US$ 361.3 billion, compared with US$ 363.9 billion for the same period in 2011-12, registering a marginal decline of 0.7 per cent (35.2 per cent in April-December 2011-12). The fall in growth rate of imports was led by decline in import of gold and non-oil non-gold imports. While the decline in former reflects the impact of hike in customs duty during initial months of 2012-13, the latter largely reflects the lower import demand for export related items and overall slowdown in domestic economic activity. Oil imports stood at US$ 125.4 billion during this period in 2012-13 compared to US$ 111.0 billion a year ago. The trend in crude oil prices is shown in Table 6.

Table 6: Trends in crude oil prices

(US$/barrel)

Period	Dubai	Brent	WTI*	Indian Basket**
1	2	3	4	5
2005-06	53.4	58.0	59.9	55.7
2006-07	60.9	64.4	64.7	62.5
2007-08	77.3	82.3	82.3	79.2
2008-09	82.1	84.7	85.8	83.6
2009-10	69.6	69.8	70.6	69.8
2010-11	84.2	86.7	83.2	85.1
2011-12	109.4	113.9	96.8	111.9
2012-13 (Q1)	106.2	108.9	93.4	106.9
2012-13 (Q2)	106.2	110.0	92.2	107.4
2012-13 (Q3)	107.2	110.5	88.1	108.3

* West Texas Intermediate

** the composition of Indian Basket of Crude represents Average of Oman & Dubai for sour grades and Brent (Dated) for sweet grade in the ratio of 65.2: 34.8 w.e.f April 1, 2011.

Sources: International Monetary Fund, International Financial Statistics: World Gem data & commodity: Ministry of Petroleum and Natural Gas, Government of India.

Commodity-wise and Destination-wise Imports (April-September 2012-13)

Commodity wise import data show that in H1 of 2012-13 the import of petroleum, oil and lubricants (POL), which constituted nearly 34 per cent of total merchandise imports, grew at 5.8 per cent in H1 of 2012-13 (Table 7 and Chart 2). Notwithstanding a decline in international price of crude oil (Indian basket) by 3.6 per cent during April-September 2012, a positive growth in POL imports essentially reflects rise in quantum terms. Import demand for capital goods and export related goods contracted mainly due to

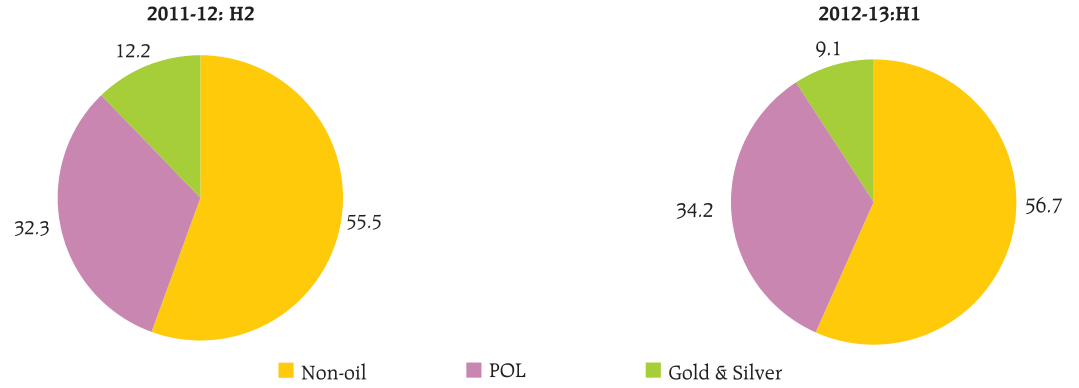
Table 7: Imports of Principal Commodities

(Per cent)

Commodity/Group	2011-12	2011-12: H1	2012-13: H1	2011-12: H1	2011-12: H2	2012-13: H1
	Percentage Shares			Weighted Contribution to Import Growth		
1	2	3	4	5	6	7
1. Petroleum, Crude and Products	31.7	31.1	34.2	14.6	12.0	1.8
2. Capital Goods	20.3	19.8	19	6.2	4.9	-1.5
3. Gold and Silver	12.5	13	9.1	7.6	2.9	-4.2
4. Organic and Inorganic Chemicals	3.9	3.9	4.1	1.1	0.9	0.1
5. Coal, Coke and Briquettes, *etc.*	3.6	3.9	3.5	2.0	2.2	-0.5
6. Fertilisers	2.4	1.9	2.1	0.1	2.2	0.2
7. Metalliferrous Ores, Metal Scrap, *etc.*	2.7	2.8	3	1.3	0.7	0.1
8. Iron and Steel	2.5	2.3	2.4	0.1	0.7	0.0
9. Pearls, Precious and Semi-Precious Stones	5.7	6.5	4.2	0.5	-3.6	-2.5
10. Others	14.7	14.8	18.4	4.5	4.2	2.9
Total Imports	**100**	**100**	**100**	**38.1**	**27.1**	**-4.0**

Source: Based on DGCI&S data.

Chart 2: Broad Pattern of India's Merchandise Imports



lower investment activity and sluggish export demand. Among capital goods, imports of 'machine tools', 'machinery (both electrical and non electrical)', 'transport equipment' and 'electronic goods' recorded a lower growth. Imports of gold and silver declined by 32.6 per cent in H1 of 2012-13, compared to a rise of 74.5 per cent in H1 of 2011-12 perhaps partly due to initial response to increase in customs duty of gold in January and March 2012.[1] Among the export related items, imports of pearl precious semi-precious stones and textile yarn have been affected due to fall in global demand.

The data pertaining to country-wise imports reflects the fact that in H1 of 2012-13, China continues to be the largest import source for India with a share of 11.9 per cent of total merchandise imports, followed by the UAE and Saudi Arabia with respective shares of 8.4 per cent and 6.8 per cent. The shares of all these countries in India's imports have increased in H1 of 2012-13. Despite a fall in the imports from the USA and Switzerland in H1 of 2012-13, these countries continued to be a significant source for India's imports accounting for 5.2 per cent and 4.6 per cent, respectively of total merchandise imports. Decline in imports from EU led to a fall in its share in India's total merchandise imports from 12.1 per cent in H1 of 2011-12 to 11.1 per cent in H1 of 2012-13 (Table 8).

[1] In January 2013, the customs duty on import of gold was increased further to 6 per cent from 4 per cent.

Trade Deficit

Owing to a sharper contraction in merchandise exports than imports, the trade deficit widened from US$ 137.3 billion in April-December 2011-12 to US$ 147.2 billion in April-December 2012-13. Net oil imports continued to be a major drag on India's trade deficit

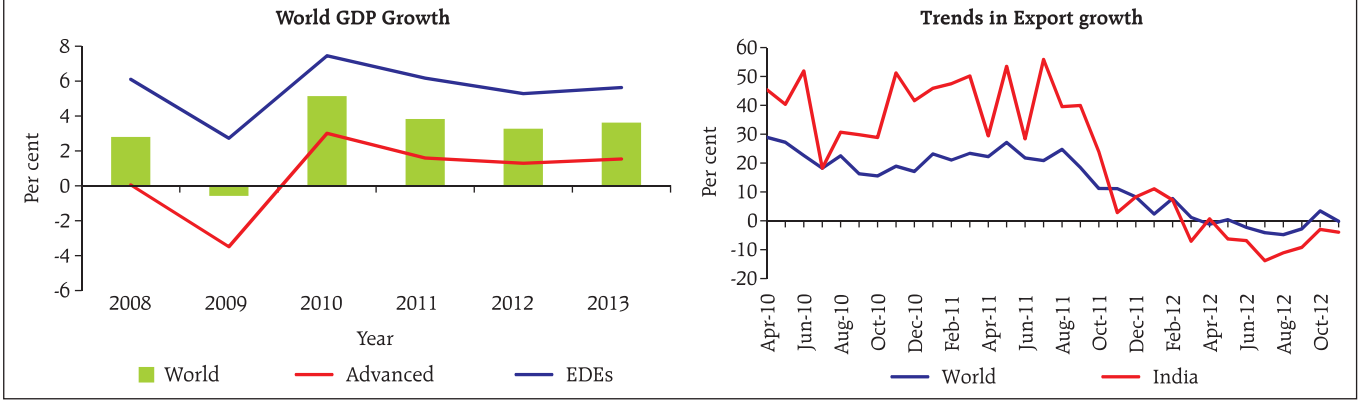
Table 8: Shares of Groups/Countries in India's Imports

(Percentage Shares)

Region/Country	2010-11	2011-12	2011-12	2012-13
	April-March		April-September	
1	2	3	4	5
I. OECD Countries	30.6	30.2	30.1	26.9
EU	12.0	11.9	12.1	11.1
France	1.0	1.9	0.8	0.9
Germany	3.2	3.3	3.3	3.1
UK	1.5	1.6	1.6	1.4
North America	6.0	5.6	5.6	5.7
US	5.4	5.0	5.1	5.2
Asia and Oceania	5.4	5.7	5.7	5.2
Other OECD Countries	7.2	7	6.7	4.9
II. OPEC	33.6	35.5	34.9	39
III. Eastern Europe	1.5	1.7	1.4	1.9
IV. Developing Countries	33.0	32.3	33.2	31.9
Asia	27.1	25.6	26.6	25.3
SAARC	0.6	0.5	0.6	0.6
Other Asian Developing Countries	26.5	25.3	26.1	24.7
of which:				
People's Republic of China	11.8	11.8	11.8	11.9
Africa	3.6	4	4.2	3.8
Latin America	2.4	2.4	2.4	2.9
V. Others / Unspecified	1.3	0.3	0.4	0.3
Total	**100**	**100**	**100**	**100**

Source: Compiled from DGCI&S data.

Chart 3: World Output and Export Growth



implying large domestic energy deficit. Net oil imports accounted for 60.5 per cent of total trade deficit during April-December 2012 as compared with 50.0 per cent during April-December 2011.

II. Global Trade

The growth in world trade volume showed substantial moderation in 2012 as both advanced and emerging market economies were impacted due to trade inter-linkages. Deterioration in India's export performance was more pronounced than that of total world exports. Going forward, the world growth is projected to increase marginally during 2013 on the back of somewhat diminished risks to growth in the euro area and the United States. Accordingly, the world trade prospects may improve gradually and the IMF also projects a higher growth in world trade volume at 3.8 per cent in 2013 as compared with 2.8 per cent in 2012 (Chart 3).

A cross-country comparison based on available data upto Q2 shows that most of the advanced economies and EMDEs have witnessed either decline or decelerated growth in exports. However, among these economies (barring Indonesia), decline was more pronounced in case of India. India's share in world exports also declined marginally (Table 9).

Table 9: Export Growth and Shares in World Exports: Cross-Country Comparison

(Per cent)

Region/Country	2010-11	2011-12	Q2:2011-12	Q2:2012-13	2010-11	2011-12	Q2:2011-12	Q2:2012-13
	Growth Rates				Share			
	1	2	3	4	5	6	7	8
World	**21.0**	**14.2**	**21.8**	**-4.2**	**100.0**	**100.0**	**100.0**	**100.0**
Advanced economies	**17.3**	**11.5**	**17.9**	**-5.8**	**60.7**	**59.2**	**58.5**	**57.5**
United States	20.4	13.3	17.5	1.1	8.4	8.3	8.1	8.5
France	8.2	9.5	14.2	-7.6	3.4	3.2	3.0	2.9
Germany	12.9	12.4	20.0	-8.1	8.3	8.1	8.1	7.8
Japan	24.1	4.3	10.9	-9.1	5.0	4.5	4.7	4.5
EDEs	27.4	18.1	27.8	-1.0	39.7	41.1	42.3	43.7
Singapore	27.3	11.9	15.9	-5.8	2.3	2.3	2.3	2.3
China, P.R.: Mainland	30.6	16.1	20.6	4.5	10.4	10.6	11.2	12.2
India	**40.5**	**21.3**	**44.7**	**-10.1**	**1.6**	**1.7**	**1.7**	**1.6**
Indonesia	29.1	20.6	31.7	-12.9	1.1	1.1	1.1	1.0
Korea, Republic of	27.2	12.7	21.4	-5.7	3.1	3.1	3.0	3.0
Malaysia	20.1	11.4	16.7	-4.7	1.3	1.3	1.3	1.3
Thailand	26.0	6.9	26.9	-6.4	1.3	1.2	1.4	1.3

Source: International Financial Statistics, IMF.

International Commodity Prices

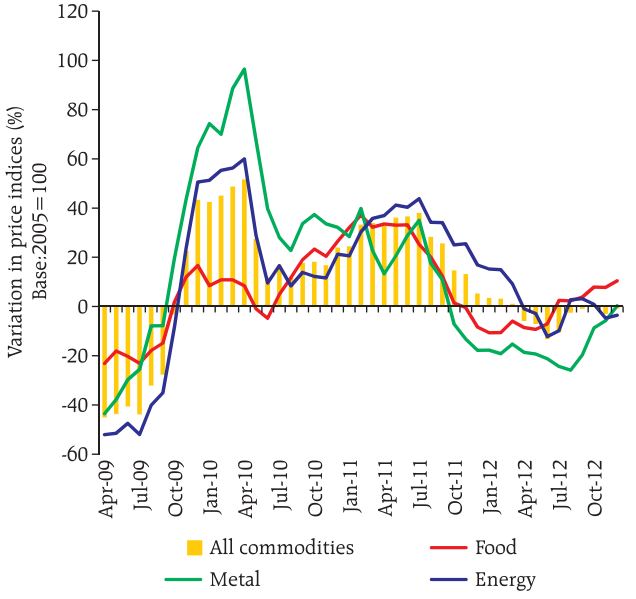
In 2012, the movements in commodity prices have been somewhat erratic reflecting major global events. For instance, price movements in the first half of 2012 witnessed easing of commodity prices especially energy and metals as European sovereign debt troubles intensified and emerging economies, especially China, showed deceleration in growth (Chart 4). However, price pressures were distinctly upward in the second half of the year. Upward pressure in the international crude oil prices emanated in the aftermath of EU embargo on Iranian oil imports in July 2012 and also due to persisting political instability in several oil-producing countries in the Middle East. In addition, renewed monetary policy easing by the central banks of the EU and the US as well as weakness of the US dollar caused rebound in other industrial commodities. Upward pressure in food prices was mainly on account of hot weather and dry conditions in the US, Eastern Europe, and Central Asia which reduced maize and wheat output in these areas.

III. Outlook

Going forward, improvement in India's export would largely depend on durable recovery in both advanced and EMDEs. Although global growth concerns have diminished somewhat in recent months, immediate recovery in the world economy cannot be expected. A broad set of indicators for global industrial production and trade suggests that global growth has not strengthened further. Recognising the lacklustre performance of export sector due to global factors, the government announced second round of export promotion measures on December 26, 2012. These mainly included (i) extension of interest subvention scheme for select employment oriented sectors (including SMEs in all sectors) upto end-March 2014, (ii) introduction of "pilot scheme" of 2 per cent interest subvention for project exports through EXIM Bank for countries of SAARC region, (iii) broadening the scope of Focus Market Scheme and Special Focus Market Scheme, Market Linked Focus Product Scheme and (iv) incentive on incremental exports to the US, EU and countries of Asia during the period January-March 2013 over the base period. In January 2013, the Reserve Bank allowed swap facility for expansion of export credit in foreign currency. Under the swap arrangement, a bank can buy US Dollars, up to its eligible swap limit, from the Reserve Bank and simultaneously sell the same amount of US Dollar forward as per the term of the swap at the prevailing market rates for swaps of similar tenor. At the end of the swap term, the bank will exchange with the Reserve Bank the US Dollars against Rupee. The Reserve Bank had enhanced the period of realisation and repatriation of proceeds representing the full export value of goods or software exported, from six months to twelve months from the date of export which has been further extended up to March 31, 2013.

Notwithstanding these measures, quick recovery in exports to major trading partners may not be imminent unless growth in both advanced and EMDEs picks up. To curb demand for some of major import items, the government has announced certain measures. For instance, the customs duty on gold was raised further from 4 per cent to 6 per cent in January 2013. Similarly, government has allowed oil marketing companies to gradually raise the retail diesel prices. The impact of such measures on India's overall trade deficit is yet to be seen and can be expected in the medium term, provided global outlook also improves significantly.

Chart 4: World Commodity Prices



North-East Monsoon 2012: An Overview (October - December) *

The North-East monsoon during October-December 2012 was 21 per cent below its long period average (LPA). Though deficient, the shortfall in rainfall during the season was less compared with the deficiencies witnessed in recent years. The overall production of rabi foodgrains in 2012-13 is estimated marginally lower at 125.5 million tonnes (128.1 million tonnes in 2011-12). At end of the season, area coverage under rabi crops was around 101 per cent of normal, and marginally higher than the previous year. Live storage to total storage capacity at 37 per cent as on March 14, 2013 for 84 major reservoirs is comparable with the previous year.

Introduction

North-East monsoon which occurs during October-December, also called the post monsoon rainfall, is an important determinant of *rabi* crop production since it coincides with *rabi* sowing. The significance of North-East monsoon can be gauged further from the fact that wheat is a *rabi* crop and around 63 per cent of all pulses and 36 per cent of oilseeds are produced during *rabi* season every year. This article reviews the performance of North-East monsoon during October-December 2012.

An Overview: North-East Monsoon 2012

Compared with the previous year when the North-East monsoon was around 48 per cent below LPA, a 21 per cent departure of rainfall in the current season from its normal has been relatively lower. The production of *rabi* pulses is estimated to record an increase of around 10 per cent to 12.1 million tonnes (11.0 million tonnes in 2011-12) in 2012-13 (Table 1).

Table 1: Production of *Rabi* Crops During Years of Deficit North-East Monsoon

(Per cent)

Years	Deviations in North-East Monsoon	Growth in *Rabi* Foodgrains (per cent)	Growth in Wheat (per cent)	Growth in *Rabi* Pulses (per cent)	Growth in *Rabi* Oilseeds (per cent)
1	2	3	4	5	6
2012-13@	-21	-2.0	-2.7	10.0	9.9
2011-12	-48	3.6	9.2	-0.9	-13.7
2008-09	-31	5.9	2.7	18.2	9.6
2007-08	-32	2.9	3.6	-11.1	-12.0
2006-07	-21	8.1	9.3	10.3	-8.3
2004-05	-11	-1.2	-4.9	-3.8	19.9
2002-03	-33	-13.1	-9.6	-18.2	-21.2

@: Second Advance Estimates.
Source: India Meteorological Department and Ministry of Agriculture, GoI.

In fact, production of *rabi* pulses for the year is poised to attain record high. This is significant given the inadequacy of domestic supply of pulses.

Cumulative Rainfall

At all-India level, cumulative rainfall recorded during October-December 2012 measured 100.6 mm as against the normal of 127.2 mm, implying a deficiency of around 21 per cent. Twenty one (21) out of thirty six (36) sub-divisions of the country received deficient/scanty rainfall. However, some sub-divisions of the peninsula and eastern region received normal to excess rainfall.

Temporal Distribution

Monthly

Five sub-divisions in the south peninsula, called the core region *viz.*, Coastal Andhra Pradesh, Rayalaseema, Tamil Nadu & Puducherry, South Interior Karnataka and Kerala, in general receive more rainfall during October-December 2012 compared with the rest of the country. During October-December 2012, cumulative rainfall in these five sub-divisions was 93 per cent of LPA (-7 per cent deviation) as against 79 per cent (-21 per cent deviation) for the country as a whole (Table 2). The cumulative monthly distribution of

* Prepared in the Development Studies Division, Department of Economic and Policy Research, Reserve Bank of India.

Table 2: Cumulative Rainfall: Monthly - All India

(in mm)

Region	2012			2011
	Actual	Normal	Deviation (%)	Deviation (%)
1	2	3	4	5
October	58.3	80.6	-28.0	-52.2
November	32.9	29.7	11.0	-30.3
December	9.4	16.8	-44.0	-55.4
Northeast Monsoon	100.6	127.2	-21.0	-48.3

mm: Millimeters
Source: India Meteorological Department.

rainfall over these 5 sub-divisions was 92 per cent, 129 per cent and 57 per cent, respectively, of LPA during October, November and December 2012.

Weekly

At all-India level, on a weekly basis, rainfall was below normal throughout the season barring one week at the beginning of the season and a week during mid-December (Chart I.a). Accordingly, the weekly cumulative also remained below LPA for most part of the period (Chart I.b).

Spatial Distribution

Coastal Andhra Pradesh within the core region received excess rainfall while Rayalaseema and Tamil Nadu & Puducherry received normal rainfall, and South Interior Karnataka and Kerala received deficient rainfall. Outside of the core region, some parts in eastern/north eastern region and parts of Central India on the other hand received excess or normal rainfall.

Subdued rainfall during the period has been reflected in the spatial distribution of precipitation over the meteorological sub-divisions spread across the country. Of the 36 meteorological sub-divisions, cumulative rainfall was excess in 2 and normal in 13 (1 and 6 in the corresponding period last year), deficient in 9 and scanty in 12 sub-divisions (5 and 23 last year)[1]. However, there was no sub-division with nil rainfall during the current season against 1 last year (Chart II, Table 3 and Statement I).

During the last ten years there were six years when North-East rainfall was deficient with the most severe deficiency being during 2011 (Table 4).

District wise

District-wise, out of 623 meteorological districts for which data were available, 31 per cent of the meteorological districts received excess/normal rainfall and the remaining 69 per cent received deficient/scanty/no rainfall during the season (Statement II). The corresponding figures for the previous year were 13 per cent and 87 per cent, respectively.

Chart I.a: North-East Monsoon: Temporal Distribution (Weekly)

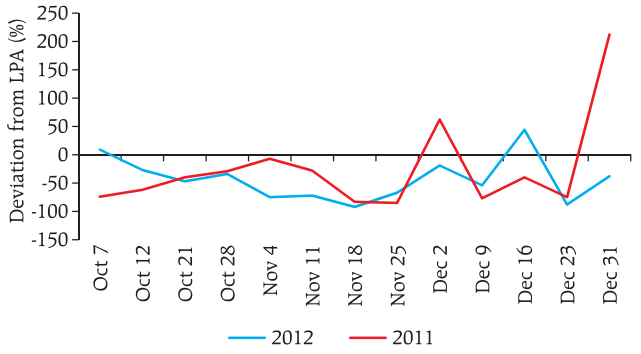
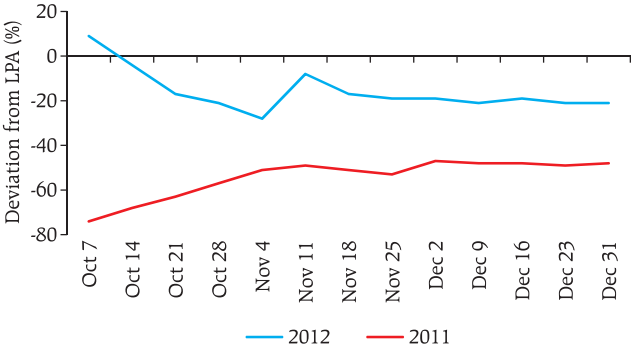


Chart I.b: North-East Monsoon: Temporal Distribution (Cumulative)



[1] Excess: + 20 per cent or more; Normal: +19 per cent to –19 per cent; Deficient: – 20 per cent to – 59 per cent; Scanty: – 60 per cent to – 99 per cent; No Rain: – 100 per cent (All with respect to the Long Period Average).

Chart II: Northeast Monsoon Cumulative Rainfall (Oct-Dec 2012)

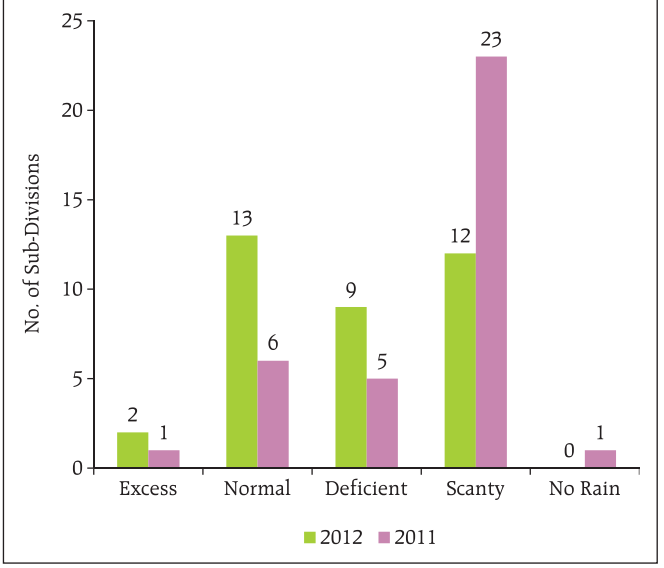


Table 4: North-East Monsoon: Cumulative Rainfall

Year	Cumulative Rainfall: Above (+)/ Below (-) Normal (per cent)	Rainfall			
		Excess	Normal	Deficient	Scanty/ No Rain
		Number of Sub-Divisions (Total=36)			
1	2	3	4	5	6
2002	-33	3	7	12	14
2003	8	9	9	6	12
2004	-11	8	10	17	1
2005	10	11	6	5	14
2006	-21	3	6	14	13
2007	-32	2	7	9	18
2008	-31	2	4	15	15
2009	8	13	10	9	4
2010	21	18	7	10	1
2011	-48	1	6	5	24
2012	-21	2	13	9	12

Source: India Meteorological Department.

Reservoir Status

The Central Water Commission monitors total live water storage in 84 major reservoirs of the country, having full reservoir level of 154.421 billion cubic meters (BCM) that accounts for around 67 per cent of the total reservoir capacity of the country. Rainfall deficiency in South-West monsoon 2012 was reflected in the lower level of water in these reservoirs at the beginning of *rabi* season 2012. Live to total capacity in these reservoirs at end-September 2012 was 74 per cent as against 87 per cent the previous year. Water in these reservoirs continued to remain below the previous year during most part of the North-East monsoon period. The live to total capacity ratio at end-December 2012 was around 59 per cent as against 62 per cent in the previous year (Table 5). As on March 14, 2013, total live storage in 84 major reservoirs was 37 per cent of the full reservoir level (FRL) as compared with 38 per cent a year ago.

Table 3: Distribution of sub-divisions according to category of rainfall

Category of Rainfall	Sub-Division
1	2
Excess	Coastal Andhra Pradesh, Telangana
Normal	Andaman & Nicobar Islands, Arunachal Pradesh, Assam & Meghalaya, Gangetic West Bengal, Orissa, Jharkhand, Konkan & Goa, Madhya Maharashtra, Chhattisgarh, Rayalaseema, Tamil Nadu & Puducherry, Coastal Karnataka and North Interior Karnataka
Deficient	'Nagaland, Manipur, Mizoram & Tripura', Sub-Himalayan West Bengal and Sikkim, Bihar, Jammu & Kashmir, Marathwada, Vidarbha, South Interior Karnataka, Kerala and Lakshadweep
Scanty	East Uttar Pradesh, West Uttar Pradesh, Uttarakhand, Haryana, Chandigarh and Delhi, Punjab, Himachal Pradesh, West Rajasthan, East Rajasthan, West Madhya Pradesh, East Madhya Pradesh, and Saurashtra & Kutch, Gujarat Region, Daman, Dadra & Nagar Haveli
No Rain	Nil

Source: India Meteorological Department.

Table 5: Reservoir Status

Status	End-September			End-December		
	2010	2011	2012	2010	2011	2012
1	2	3	4	5	6	7
Total Live Storage (BCM)	114.45	131.49	115.00	104.68	94.38	91.43
Percentage of Live Capacity at FRL	75	87	74	69	62	59

BCM: Billion Cubic Meters. FRL: Full Reservoir Level.
Source: Central Water Commission.